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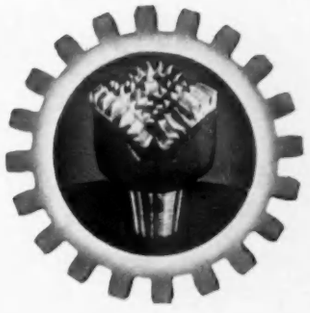

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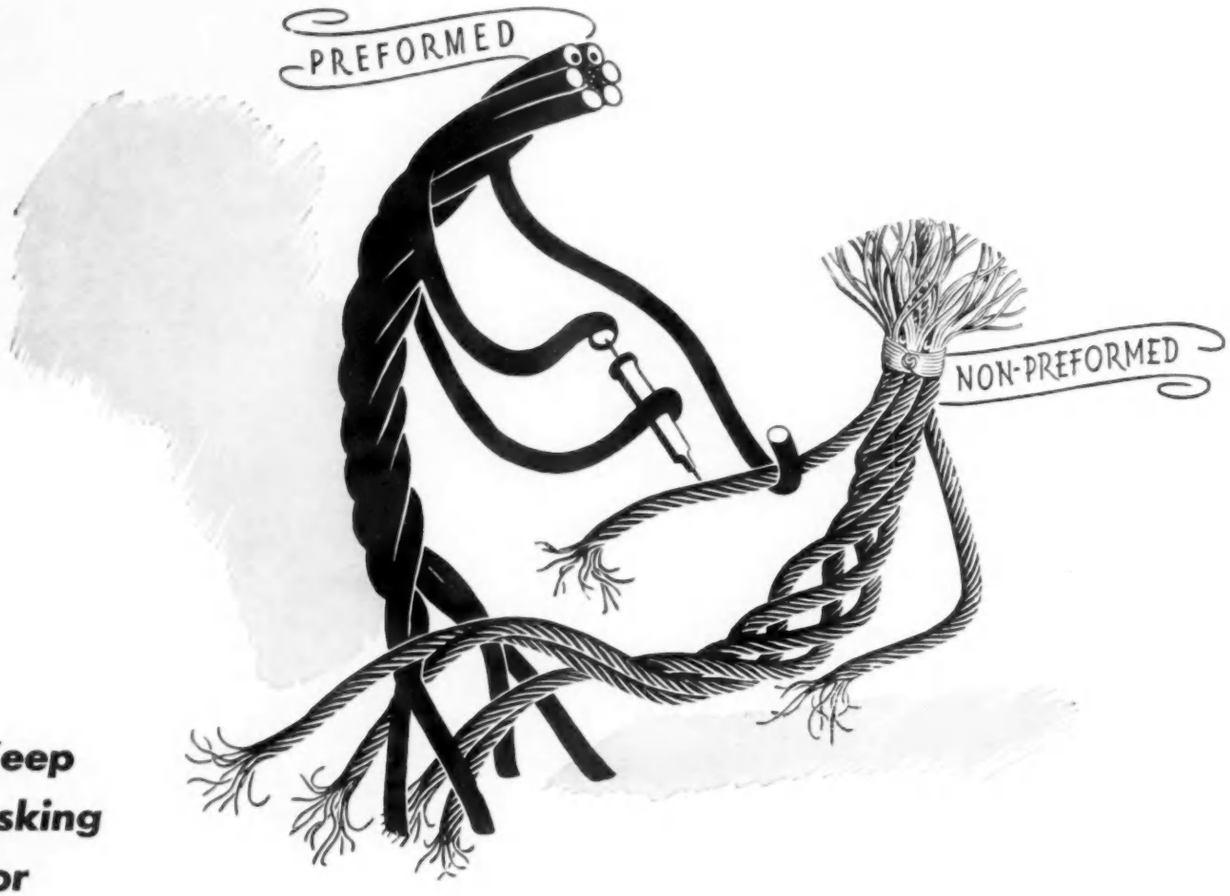

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LOOKING AHEAD
. . . with the Editor

THERE is a growing feeling within the industry favoring widespread relaxation of PAW regulations, especially those governing production. Also there is a belief that certain divisions of the organizations have outlived their usefulness and should be eliminated. Many operators are inclined toward the opinion that unless these modifications and changes are made, it will be impossible to meet the demand for crude oil this year. Next week THE OIL WEEKLY will present a review of suggested modifications that might be effected forthwith, and still leave PAW with the control needed to exercise its functions.

THE OIL MAN'S CALENDAR

MAR. 8	Spring Meeting East Texas Chapter API, Kilgore Hotel, Kilgore.
21–23	American Association of Petroleum Geologists, Society of Exploration Geophysicists and Society of Economic Paleontologists and Mineralogists, Baker Hotel, Dallas.
22–23	Southern Gas Association, Roosevelt Hotel, New Orleans
23	Spring Meeting Pacific Coast District API, Biltmore Hotel, Los Angeles.
APRIL 3–4	Interstate Oil Compact Commission, Quarterly Meeting, Roosevelt Hotel, New Orleans.
10–12	National Association of Corrosion Engineers, Annual Meeting, Rice Hotel, Houston.
12–14	Natural Gasoline Association of America, Baker Hotel, Dallas.
13–14	American Petroleum Institute, Eastern District, Division of Production, Deshler-Wallick Hotel, Columbus, Ohio.
20–21	National Petroleum Association, Semi-annual Meeting, Cleveland Hotel, Cleveland.
24–25	National Oil Scouts and Landmen's Association, Hotel Adolphus, Dallas.
OCT. 12–13	Texas Mid-Continent Oil & Gas Association, Houston.
NOV. 13–16	American Petroleum Institute, Stevens Hotel, Chicago.

THE OIL WEEKLY

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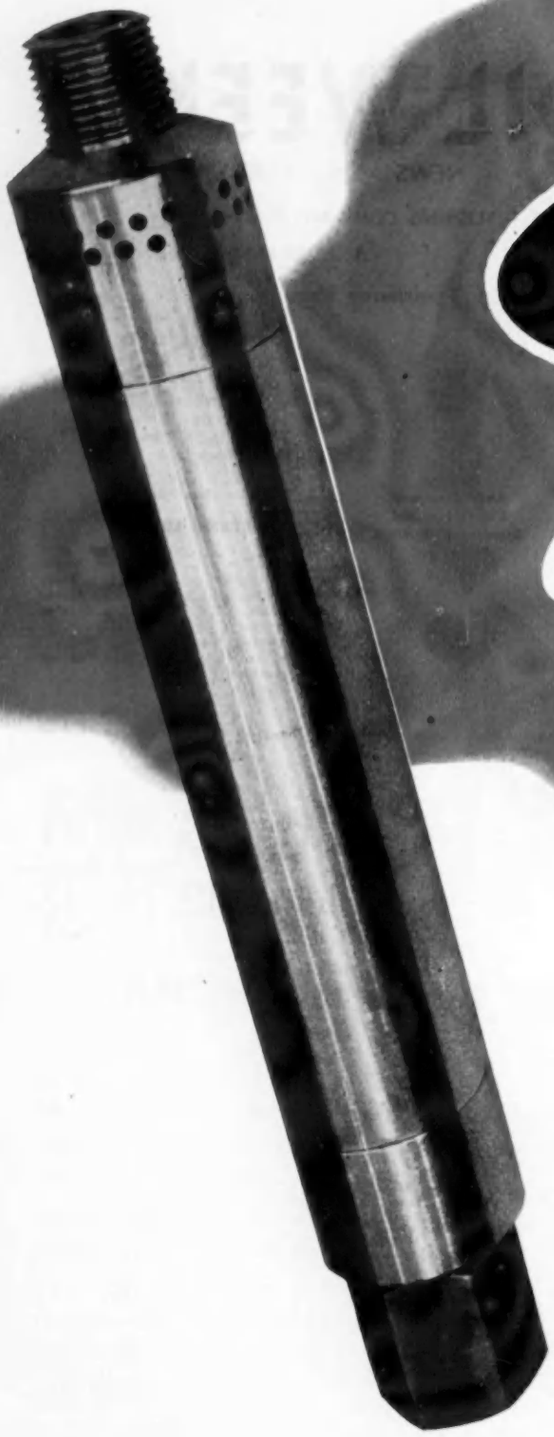

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The Changing Panorama

Layman to Hear Much About Oil

FOR some time the average citizen has been hearing considerable about the oil industry, but it is probable that he will hear a great deal more in coming weeks than ever before, for petroleum is moving into the political spotlight.

Both Congress and administration officials are exhibiting a growing interest in petroleum, now that it has become generally recognized that the security of the nation is dependent upon adequate supplies of oil. Several Congressional investigating committees are about ready to study the question of future oil supplies and foreign oil policies, and the average citizen will read much about these matters in his daily newspapers.

Further, the question of foreign policy is going to become more important, perhaps a vital part of the forthcoming presidential campaign, and now that the government proposes to spend $130 to $165 million for a pipe line in Arabia, foreign policy cannot be discussed without involving oil.

U. S. Told Canadian Prospects Bright

GEOLOGISTS of the United States recently have learned more about the Norman Wells (Fort Norman) field and the surrounding region of Canada through addresses of Dr. George S. Hume, geologist for the oil controller of Canada, who has been appearing before local chapters of the American Association of Petroleum Geologists. Last week he was in Houston, Lake Charles and Jackson, concluding a tour that previously included 15 other cities.

Hume's discussions left no doubt that the Norman Wells development will stimulate further extensive development and discovery of additional important fields in the Mackenzie River Basin, Canada's most promising prospecting territory. In a wide belt straddling the river for hundreds of miles, north and south of Norman Wells, there are within reach of the drill potential petroleum-bearing limestones and sandstones ranging in age from Silurian to Cretaceous, and numerous seepages give abundant tangible evidence of oil, while many folds and faults suitable for accumulation of oil and gas have been observed, giving definite promise of important new fields.

So far as Norman Wells itself is concerned, Hume believes it is a reserve of at least 20,000,000 barrels and probably more. The productive area, already roughly defined as consisting of about 5000 acres, is much larger and more productive than was anticipated by those familiar with it previous to commencement of the Canol development, although it is not as large as some political and newspaper accounts would indicate. While no East Texas, the field apparently is comparable with the average major field in the United States.

Norman Wells production is from a coral reef lying on top of the Middle Devonian limestone and ranging in thickness up to 425 feet, Hume said. The strata dip northeast to southwest. Wells on the northeast bank of the Mackenzie River are about 1100 feet deep, and wells on the opposite side of the field, located on Bear Island in the river about 1½ miles distant, yield oil from 2000 feet. The river here is 3 miles wide, including Bear and several smaller islands, but the field apparently extends only to the southwest part of Bear Island.

A large part of the field lies under the river, between the northeast bank and Bear Island, and this fact probably will complicate development and require much engineering. While floods and summer thaws of the big river would be a problem in themselves, an even greater deterrent would be the heavy ice and ice floes, which likely would snap off wellheads.

Prior to Canol development, Imperial Oil Company had completed 4 producing oil wells and several dry holes that partly defined the field; and under Canol 23 oil wells and 7 dry holes were completed from mid-1942 to November 1, 1943.

Gasoline Taxes Still Tops

DESPITE rationing, gasoline taxes were the biggest revenue producer in the states during 1943, accounting for almost 20 percent of total state revenues. Next in order were income taxes and other sales taxes, accounting for about 17 percent each, followed by taxes on motor vehicles, alcoholic beverages, property, tobacco, insurance companies, public utilities, franchises and inheritances.

Big-Inch to Rescue Of Eastern Coast

RESIDENTS of the East Coast are caught right now between several wartime factors that have reduced oil supplies to a minimum and they, like Secretary Ickes, perhaps are "shuddering to think how much more serious, yes, even catastrophic the situation would have been today if the 24-inch pipe line had not been in operation during the past 12 months."

Big-Inch has done yeoman service since oil started flowing into the Norris City terminal of the western leg of the line on February 19, 1943, and first deliveries were made the following August 15 to the East Coast. Scheduled for a capacity of 300,000 barrels daily, the line has exceeded that figure repeatedly, the western leg hitting a top of 324,928 barrels on September 25 and the eastern leg 311,693 barrels on December 21.

As Administrator Ickes said when he told of the 88,000,000 barrels of oil moved through the Big-Inch line the first year, "Everyone who has had a part in the building and operation of this line should feel proud that he has had an important role in the battle of oil."

Chemicals Overlooked In Oil Production

THE refining division of the oil industry has branched into the chemical industry at a very rapid rate in the last five years. However, it has overlooked the potentialities of production of chemicals by its producing departments. There is little question that each year large quantities of valuable chemicals are penetrated in the course of drilling oil tests. A few of the more progressive producing departments are now devoting a considerable research to this field, and this is a trend that can well be more extensively developed.

The oil producer's dream is to hit a sand averaging 500 barrels of recoverable oil per acre-foot, reflecting a potential recovery of $650 per acre-foot. Contrasted with this, recoverable salts have a very much higher foot value. For example, a fertilizer salt, potassium chloride, as it is found in Eddy County, New Mexico, has a recoverable value of $20,000 per acre-foot, according to Walter M. Cross, Jr., of Kansas City Testing Laboratory. Bromine and iodine

salts are of much higher value although they are less liable to be found in large quantities.

In 1938 United States production of potash was only 3.2 percent of the world production. The market may be expected to be an expanding one as in the past, because each year millions of tons of potash are taken from the soil by crops. Potash is not only necessary to the growing of crops but is required by the human body to the same extent as iron is required. A study of the Permian Basin, and more particularly of the Delaware Basin, indicates good possibilities of finding large amounts of three chemicals basic to industry. These chemicals in order of expected quantity are potash, bromine and iodine. These should be of particular interest to oil producers because they are water-soluble and can be mined by bore holes. Potash is a radioactive salt and responds well to electronic logging.

Canol Pipe Line Is Completed

WHILE millions have talked about the Canol project, pro and con, a few have steadily worked on it, and now the Norman-Whitehorse pipe line, vital part of the $130,000,000 undertaking, stands completed, ready for test runs. Meanwhile, adequate crude production is ready for turn of the valves at Norman Wells, where a "major oil field" has been partly developed, while refining facilities at Whitehorse will be completed in May.

Final joints in the United States-financed 600-mile, 4-inch pipe line, designed to deliver 3,000 barrels per day, were welded last week near Macmillan Pass, astride the Arctic Continental Divide, deep in the Mackenzie mountain range, construction having proceeded from both ends of the route.

"The pipe-line project is completed as of today," stated Brigadier General L. D. Worsham, commanding general of the United States Northwest Service Command at Whitehorse, Yukon Territory, on February 21, "and we hope soon to make the first test runs at Whitehorse."

Started on June 29, 1942, when a Japanese attack on Alaska appeared imminent, the whole project has consisted of drilling of wells at Norman Wells, construction of a mountain road and paralleling pipe line from Norman Wells to Whitehorse, pump stations and storage tanks, a refinery that was dismantled in Texas and transported to and enlarged at Whitehorse, a network of distribution pipe lines from refinery site to other points in Canada and Alaska, and an auxiliary pipe-line system consisting of 110 miles of 4-inch for delivering California gasoline from Skagway to Whitehorse, after being laid down by tanker at Prince Rupert and then barged from there to Skagway.

This Week's Absurdity: A statement in the *United States News* magazine that "oil geologists expect new oil fields will be found sooner or later in or adjacent to the United States."

The truth is that new fields are constantly being found in the United States. A total of 275 new oil fields were discovered during 1943, and 288 new oil fields were found during 1942.

Disposal of Tankers Post-War Problem

AT THE close of the war, the United States government will own a tonnage of ocean-going ships in excess of the combined fleets of all other countries in the world. Estimates put the surplus tonnage that will have been accumulated above 21,000,000 tons. Tanker construction has constituted one of the largest phases of the shipbuilding program, there having been 231 tankers constructed during 1943. The oil industry, therefore, will have direct interest in what is to be done with these ships after the war.

Such a fleet of government-owned ships presents a problem to private transportation. Unless national policy for domestic common carriers encourages the development of competitive transportation systems, one of two alternatives appears inevitable:

1. Vessels will be sold at auction prices to independent companies and operated wholly apart from any other transport service in inland, coastwise, or intercoastal traffic; or

2. If the government retains ownership, it will, as past experience indicates, operate the vessels at a loss to the public which must necessarily be defrayed by subsidy.

As the Transportation Association of America has put it, "One mode of transportation which is wholly privately owned and must pay its full way cannot compete with another mode which is owned or subsidized by the government. The policy we adopt for the peacetime treatment of our water facilities operating in the domestic field may well determine whether we shall preserve private ownership for the entire common-carrier industry."

Gasoline or Reporter On the Loose?

BIG-INCH pipelines make news, but there seems to be a studied attempt to make scareheads when a three-line filler will tell the story. "Little Big-Inch" made the headlines the other day with the story that 100,000 gallons of gasoline had broken loose near Batesville, Indiana, and was threatening the civic water supply, piscatorial pastimes, and the quality of the yield from the area's many milch kine.

Investigated, from the pipeliner's viewpoint instead of the paragrapher's, it appears that possibly some 300 barrels (of 42 gallons each) did escape through an open valve when a threatened fire in the nearby stationhouse demanded the attention of the crew supervising drainage of water from the line ahead of the advancing column of gasoline. Since the loss (immediately impounded in a gulley and mostly reclaimed) may have totalled 300 barrels, and the flow through the line is about 68 barrels per minute, the total time the line was open could not have exceeded 4½ minutes. And it takes 5 minutes of most strenuous exercise to wheel shut one of the big gates on the line. So the escaping stream—reaching the station ahead of computed schedule — cannot have been "on the loose" nearly as long as was the reporter's imagination.

If the reported amount of fluid had escaped, it would have required uninterrupted flow from the line for 35 minutes, and the area would have been blanketed with a cloud of gas so far reaching that it is impossible to vision its existence without somewhere having reached an igniting spark. And even the reporter noted no blaze.

The two Big-Inch lines are making news—good news of wartime needs delivered—and need no press-agenting of the sensational sort to keep them in the public mind.

* * *

Low-temperature welding, in which a process similar to welding applies alloys at temperatures far below the melting point of the parent metal offers a means of effecting pipe-line repairs to mains under pressure, and without the fire and explosion hazard introduced when the spot being reinforced is brought to a temperature high enough to ignite gas or oil escaping near the site of the repair.

* * *

Timber, encased in a closely welded steel sheath or jacket, offers a new material for marine structures where borers are active, while overhead structures of the combined material are easily maintained, fireproof and lighter than either material would be for equivalent strength.

Prospective Rig Manufacturing Rate Below Drilling Needs

Survey of manufacturers indicates probable production of replacement parts and new units in 1944 will fall below requirements of expanded drilling activities

By ELTON STERRETT, Equipment Editor

SURVEY of probable drilling manufacture during 1944 offers little hope to the driller who is frantically patching together his worn-out equipment in the endeavor to keep going until new equipment becomes available. On the basis of returns from those manufacturers normally turning out rotary equipment for drilling wells in the 6000-10,000-foot and 10,000-15,000-foot ranges, it appears that there will be produced 196 complete rigs for medium-depth drilling and 169 units which will be capable of exploration below the 2-mile limit.

Thus the industry may expect, under present materials allocation, a total of not more than 365 new drilling rigs during the year. Since materials for the first half of the year, and in many instances for the third quarter as well, are already set, it is improbable that relaxation in materials limitations would enable any of the manufacturers to reach capacity before the second half of the year, and thus the 100 percent potential increase in manufacturing output projected by the survey over present schedules could result in a possible gain of not more than 25 percent of the rigs now in process, or perhaps another 90 units capable of deep drilling.

Since the rigs now in operation represent for the most part units which have been running since before Pearl Harbor, there is a backlog of deferred normal replacement which, on the basis of 20 percent replacement per year, now would absorb (were units suddenly available) not less than 400 new rigs, in addition to the heavy draft on the manufacturers for part replacement of drawworks, rotary, crown and traveling blocks, and other heavy equipment which has been provided so far by a program of "borrowing" from stacked rigs or those able to get along with lighter units.

On the basis of necessary replacement, there will therefore be only a relatively few new rigs available for the stepped-up wildcatting program, and many of these will not come out of the manufacturers' plants until well along in the year. Only through relaxed materials limitations—the immediate availability of special alloys, alloy steels and augmented raw materials—could the manufacturers hope to better the outlook before mid-year, or even to promise betterment during the second half of 1944. The steel supply, on a tonnage basis, seems to offer prospective relief. But shortages in one item, such as the special alloy shaft required to meet deep-drilling stresses, can hold up the production of an entire line of drawworks, and the part completion of the unit, or the substitution of less suitable steels cannot solve the new unit problem.

Several equipment manufacturers cite bottlenecks which operate to throttle their output below a rate which otherwise might be attained. One shortage exists in the procurement of adequate prime movers for powering the rig. Where a complete outfit is supplied, the motive power preferably should be designed into and made a part of the complete unit, if maximum operating efficiency is to be attained. And power units are high on priority and scarcity lists, with every likelihood that the demand for suitable units outside the oil industry will increase rather than lessen—at least during the first half of the year. Thus possible new rigs are being delayed by lack of power, and are being withdrawn from unit outfits to provide replacement parts for rigs currently operating.

Present absorption of manufacturing facilities by war contracts—much of the machine-tool equipment suitable for production of heavy drilling equipment was readily convertible to munitions and materiel production is cited as another reason why equipment manufacturers are unable to step up present new rig manufacture to a rate which will more than keep abreast of normal rig retirement figures. Manpower, especially in the more highly skilled branches, is listed as a factor in possible increased manufacturing schedules, but is not given the rating accorded the material situation.

Figures on probable 1944 output of complete rigs—or complete insofar as the individual manufacturer goes with rig construction—are subject to widely varied increases on the supposition that required raw materials and power units could be made available. The percentage gains over present probable schedules ranges from a 50 percent step-up by one maker of heavy-duty equipment, through doubling of estimated outputs by several, to a top increase of 250 percent by another. This last, however, is especially pessimistic on the labor problem, being located in a center where the labor pool is restricted, and where draft on available skilled trades is intensified by heavy migration of unskilled workers to occupation-deferred jobs elsewhere.

On the face of returns from the survey, it is evident that most of 1944's increase of drilling must come through even greater efficiencies attained with present units; that most of the new equipment manufactured during 1944 must go for replacements on presently running rigs if they are to be kept in operation; and that only a sudden windfall to the industry in the form of unexpected—and unknown—stocks of the proper raw materials can enable more than 365 heavy-duty rigs to be produced during 1944. Of these, due to the lag in shipment, transportation and rigging-up, it is probable that at least 75 will not add to the number of completions during the calendar year.

Of the 365 rigs scheduled for manufacture, it is needless to state that present orders cover practically the entire total, with units going to form a backlog against orders probably originating within the first half of the year certainly inadequate to meet the additional demand.

A Lesson

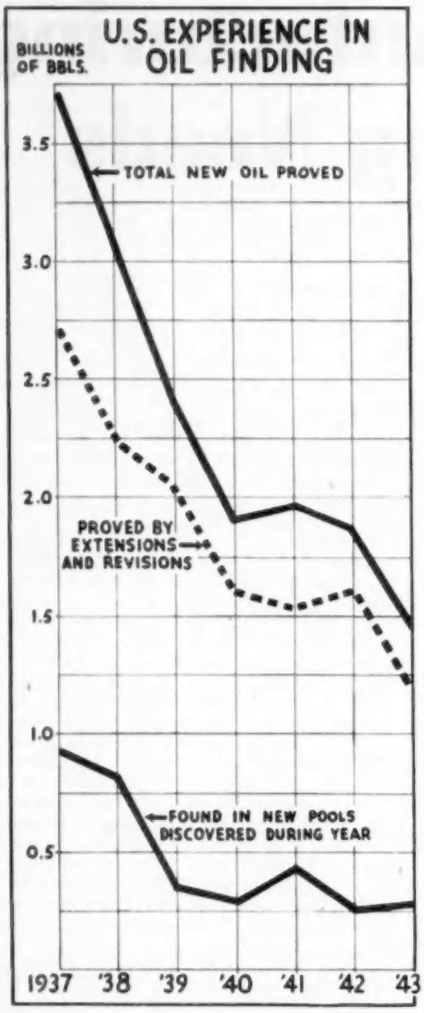
A QUOTATION from the "Stars and Stripes" official paper of the American Expeditionary Forces, printed in Italy, November 22, 1943:

"As the debris of fascist rule is swept up, the corruption that became part and parcel of the Mussolini regime becomes only too evident. How else except through the wholesale bribery of willing officialdom could be explained, for instance, the ever present black market, only one of the many phenomena the American soldier in Italy runs up against daily? Corruption so permeated the entire fascist governmental structure that a large part of the population soon found it necessary to buy and sell illicitly in order to get the barest necessities of life.

"The stultifying regimentation of fascism produced a generation trained to act only on direct orders from above. Workers and employers, business and professional men were all under the heavy hand of a corrupt bureaucracy. Journalists wrote only when the directives arrived from Rome; professors dared not teach until words had been put in their mouths; architects could design and builders could build only in the approved fascist manner. Even the farmer had to plant and harvest not according to the needs of the country but according to the latest fascist directive.

"The house of fascist cards collapsed and the hollowness of the structure is now here for us to see. Italy is prostrate because fascism sapped her initiative and corrupted her life. Italians have learned their lesson the hard way. May this lesson never be lost on America!"

API Announces Annual Petroleum



THE United States failed by only 18,641,000 barrels to find as much new additional oil as it produced during 1943, although crude production for the year was at an all-time peak, according to the annual report of the American Petroleum Institute's committee on petroleum reserves, released last week.

A total of 1,484,786,000 barrels of heretofore unknown oil was proved to exist during the year, in contrast with the production of 1,503,427,000 barrels, the committee reported. Consequently, United States' proved reserves on December 31, 1943, stood at 20,064,152,000 barrels, compared with 20,082,793,000 barrels a year previous.

Although the API report is the most encouraging of several crude reserve estimates made public, it also reflects a declining discovery rate. The 1,484,786,000 barrels of new oil blocked out during the year is the smallest volume found in any one year since the committee began studying oil finding rates in 1937. There has been an almost unbroken decline each succeeding year in quantity found, the rate in recent years being but half that of 3,721,532,000 barrels found during 1937.

The API committee estimates that 282,418,000 barrels of the new oil found during 1943 was located in new pools discovered during the year, and that the additional 1,202,368,000 barrels proved to exist was the result of revisions of previous estimates (because of additional development) and extensions of known fields.

The committee report emphasized that its estimates referred only to reserves actually proved by drilling and production performance, the group never having attempted to evaluate unproved reserves, "for such estimates would only be guesswork regardless of whom the author might be." Therefore, the findings of the committee are not offered as an inclusive estimate of all the potential crude oil resources in this country.

As explained by the committee's chairman, J. Edgar Pew, the "estimated proved reserves, as used in this report, represent only the known amount of crude oil in this country which may be extracted from the earth by present known methods from fields developed or drilled, or sufficiently drilled and explored to permit reasonably accurate calculation.

"The full amount of crude oil resulting from a new discovery is not known until the productive limits of such new discovery can be fully outlined and usually this is not possible for a period of years. Hence the committee goes about computing the annual additions to estimated proved reserves of crude oil by the following method:

"Initially the committee includes in its estimate of the reserves of a new discovery only that part which in the preceding year has been proved on the basis of a conservatively defined formula. For instance, a field tested only by a few wells is assigned relatively low reserves, even though there is evidence that this figure may be augmented by subsequent drilling. This is listed as oil blocked out 'Through New Pools Discovered.'

"In each succeeding year the committee reviews its original estimate of reserves in that field, taking into consideration the progress of development, such as the drilling of additional wells, the installation of gas or water drive, improved extraction methods, and the knowledge that has become available regarding the field's productivity and well performance. As a result of this annual review the estimated proved reserves credited to that field are increased, or decreased, as the facts require, under the heading 'Through Revision of Previous Estimates and Extensions to Known Fields' and this revision is carried into the total figure for the field."

The committee undertook this explanation because persons not familiar with these surveys have misinterpreted the figure for estimated proved reserves as representing the entire oil resources of the United States, and because of a growing tendency to consider only the reserves found "Through New Pools Discovered" as new additional oil. The reserves found through new pools discovered and through revisions of previous estimates and extensions to known fields are equally important, declared Pew, and "each is as much a part of the

TABLE 1

API Estimate of Proved Petroleum Reserves in the United States

(Barrels of 42 U. S. Gallons)

	Proved Reserves as of (Dec. 31, 1942) (1)	Changes in Proved Reserves Due to Extensions and Revisions During 1943 (2)	New Proved Reserves (New Pools) Discovered in 1943* (3)	Production During 1943 (Estimated) (4)	Proved Reserves as of Dec. 31, 1943 (Columns 1+2+3 Less Column 4) (5)
Arkansas	300,026,000	21,995,000	2,536,000	27,628,000	296,929,000
California	3,195,846,000	408,993,000	16,170,000	284,186,000	3,336,823,000
Colorado	39,443,000	7,996,000	.....	2,328,000	45,111,000
Illinois	306,778,000	65,803,000	4,226,000	82,185,000	294,622,000
Indiana	31,773,000	4,258,000	272,000	5,264,000	31,039,000
Kansas	686,975,000	19,772,000	45,352,000	106,247,000	645,852,000
Kentucky	34,653,000	4,650,000	3,815,000	7,928,000	35,190,000
Louisiana	1,442,126,000	111,984,000	53,491,000	123,775,000	1,483,826,000
Michigan	63,843,000	6,187,000	5,900,000	20,682,000	55,248,000
Mississippi	40,897,000	14,397,000	2,468,000	18,890,000	38,872,000
Montana	85,558,000	30,123,000	200,000	7,824,000	108,057,000
Nebraska	2,177,000	523,000	.....	654,000	1,000,000
New Mexico	677,497,000	13,801,000	1,140,000	38,457,000	653,981,000
New York	54,395,000	41,180,000	.....	5,050,000	90,525,000
Ohio	35,021,000	600,000	1,527,000	3,305,000	32,643,000
Oklahoma	968,927,000	12,194,000	50,524,000	123,027,000	908,618,000
Pennsylvania	153,118,000	.....	.....	15,795,000	137,323,000
Texas	11,545,727,000	283,823,000	88,969,000	593,565,000	11,324,954,000
West Virginia	47,187,000	.....	.....	3,348,000	43,839,000
Wyoming	370,572,000	156,335,000	5,728,000	33,241,000	499,394,000
Miscellaneous†	254,000	.....	100,000	48,000	306,000
Total United States	20,082,793,000	1,202,368,000	282,418,000	1,503,427,000	20,064,152,000

* Only a limited area is assigned to each new discovery even though the committee may believe that evantually a much larger area will produce, for in this report we are concerned only with actually proved reserves. † Includes: Florida, Missouri, Tennessee, Utah and Virginia.

Reserves Figures

Comparatively encouraging report shows U. S. proved reserves drop only eighteen million barrels in year; discovery rate of new oil, however, continues downward

yearly additions to estimated proved reserves as is the other."

Foresees Additional Discoveries

Comforting, at a time when reassurance is needed, is Pew's statement that "there is no doubt of the existence of great reserves of crude oil not yet discovered or proved, and hence not considered in this report," and that he expects the United States will be able to meet the nation's requirements for oil products from domestic sources "for many generations to come," if permitted "an adequate and fair price for its products."

"Every year new and important discoveries have been made and there is no reason to believe this trend shall suddenly come to an end in the foreseeable future," asserted Pew. "We know there are vast areas yet unexplored that can produce oil, some of which have known structural conditions and all of which have sedimentary conditions favorable for the production of oil."

While this conclusion tends to discount or mark as only temporary today's apparent need of foreign reserves to supplement domestic sources, the full statement by the committee chairman turns the spotlight on several important handicaps currently circumscribing the efforts of the industry to maintain and expand available domestic reserves.

An outstanding and very real handicap has been that of inadequate skilled manpower as well as equipment. "The oil industry has been handicapped in the past three years in its search for oil through a scarcity of skilled field manpower and a scarcity of equipment," stated Pew. "Particularly burdensome," he added, "has been the scarcity of technical engineers who have become so important in carrying on the geophysical work so necessary for the discovery of oil from deeper formations," although the industry nevertheless has managed to maintain a favorable reserves position.

Continued maintenance of adequate reserves will require, he said, discovery of new pools, finding of new, deeper pay horizons in established fields, extensions of producing areas, better techniques in production, more extensive secondary recovery operations, and opportunity for development of vast new areas so far untested and undeveloped. Through these means, he asserted, adequate oil supplies can consistently be obtained, as attested by the whole history of the industry, provided prices furnish the necessary incentive for the development.

"The industry cannot discharge its responsibility to the public of giving assurance of adequate supplies for the future if it is required to continue depletion of its known reserves at a price based on costs which are less than the cost of replacing such reserves," Pew continued. "A fair price level would be not only an incentive to the replacement of existing reserves, but it also would act as a spur to the development of synthetic oils derived from a distillation of coal and shale which we have in abundance. Thus, if our reserves at some future date should fail, we would have synthetic substitutes on their way to commercial production."

California Increase

The largest amount of new oil found during the year was credited to California, the report showing 408,993,000 barrels for extensions and revisions and an additional 16,170,000 through new pools discovered. Consequently, the state's remaining proved reserves at the end of the year totaled 3,336,823,000 barrels in contrast with 3,195,846,000 barrels a year previous.

Texas was credited with finding of 283,823,000 barrels through extensions and revisions and 88,969,000 through new fields. However, this did not equal the state's record production of 593,565,000 barrels, and its reserves dropped from 11,545,727,000 barrels a year ago to 11,324,954,000 the first of the current year. This was the largest decline shown by any state.

Wyoming showed a substantial increase, its reserves rising 129,000,000 barrels to 499,394,000 barrels, as a result of 156,335,000 barrels of new oil proved through extensions and revisions and 5,728,000 barrels proved to exist through new pools discovered.

TABLE 2

Summary of API Committee's Annual Reports Covering Period 1937-1943

(Barrels of 42 U. S. Gallons)

YEAR	New Oil Blocked Out During Year: Through Revisions of Previous Estimates and Extensions to Known Fields	New Oil Blocked Out During Year: Through New Pools Discovered During Year	New Oil Blocked Out During Year: Total Through New Discoveries, Extensions and Revisions	Production During Year	Estimated Proved Reserves as of End of Year
1936	.....	.....	.....	.....	13,063,400,000
1937	2,792,790,000	928,742,000	3,721,532,000	1,277,664,000	15,507,268,000
1938	2,243,571,000	810,493,000	3,054,064,000	1,213,186,000	17,348,146,000
1939	2,058,455,000	340,667,000	2,399,122,000	1,264,256,000	18,483,012,000
1940	1,607,012,000	286,338,000	1,893,350,000	1,351,847,000	19,024,515,000
1941	1,538,989,000	429,974,000	1,968,963,000	1,404,182,000	19,589,296,000
1942	1,618,925,000	260,051,000	1,878,976,000	1,385,479,000	20,082,793,000
1943	1,202,368,000	282,418,000	1,484,786,000	1,503,427,000	20,064,152,000

Natural Gasoline Shows Increase for Past Year

Natural gasoline and allied production in 1943 reached 3,703,518,000 gallons, against 3,499,524,000 gallons in 1942, it was reported last week by the Bureau of Mines. Over-all increase in production last year was 6 percent, but gains of 7 percent were recorded in Texas, 9 percent in California and 32 percent in Illinois, with a loss of 5 percent in Oklahoma.

December production totaled 327,516,000 gallons against 322,854,000 gallons in November, but daily average output dropped to 10,565,000 gallons from 10,762,000 gallons.

The 1943 production, it was shown, included 2,025,744,000 gallons of natural gasoline against 2,071,104,000 gallons in 1942; 686,794,000 gallons of cycle products against 654,864,000 gallons; 170,184,000 gallons of iso-butane at natural gasoline and cycle plants against 101,682,000 gallons; 824,796,000 gallons of other liquefied petroleum gases at natural gasoline and cycle plants against 671,874,000 gallons; 170,898,000 gallons of liquefied refinery gas at refineries against 226,842,000 gallons, and 100,800,000 gallons of benzol against 100,674,000 gallons.

Stocks of natural gasoline and allied products decreased during December and at the end of the year were 190,722,000 gallons, compared with 195,090,000 gallons on November 30 and 194,544,000 gallons on December 31, 1942. The year-end stocks included 103,152,000 gallons at refineries and 87,570,000 gallons at plants and terminals.

Care of Oil Field Emulsion Heaters and Treaters

Use of radiant heat becoming common in oil field where fight against scaling, varying in different sections, is continuous

By G. E. DAKE, Chief Engineer, and J. A. LYNE, Chief Field Engineer,
The Parkersburg Rig & Reel Company

PROBABLY the most serious difficulty experienced with oil-field heating equipment is the deposits of salts which accumulate as the result of heating oil-field waters, and from coke formed on high-temperature surfaces.

Were it possible to design equipment in which the desired result of heating water, emulsion and oil could be accomplished and still not promote changes favorable to deposition in the fluids, we would have an ideal condition. This, because of the nature of the materials worked with, is impossible.

Oil-field waters contain a number of salts which become less soluble at increased temperatures and from which precipitates will form which will collect on the hot surfaces as well as in other parts of the equipment. Sodium chloride, when subjected to alternate heating and cooling as is experienced in automatic equipment in intermittent operation tend to precipitate. This phenomenon is known as "salting." Its cause is obscure and with present day knowledge, its complete elimination is impossible. It starts on heating surfaces, and once started, proceeds with great rapidity until the equipment is not fit for operation and must be cleaned to remove accumulations of salt crystals.

Other Scales

The deposition of scale other than salt is another factor. Besides salt there are the scale-forming materials contained in oil field brines. These consist mostly of calcium, magnesium carbonates and sulphates whose solubility decreases when subjected to boiling, which we believe may occur immediately adjacent or on the heating surfaces even though the liquid behind them is at a temperature lower than boiling. When the solubility decreases the solution becomes more concentrated and will deposit some of the solids on the hot surfaces.

Where boiling occurs, the water is evaporated with the formation of steam bubbles. This will leave a deposit of solid material on the surface, which, as is the case with carbonates of lime, will not go into solution again when contacted with water.

In addition to salt and scale there is the additional possibility of coke forming on the hot surfaces due to the distillation of the volatile fractions of the oil from the emulsions or free oil coming in contact with them. This coke may also build up to a considerable thickness.

These deposits, which, regardless of their constituents, usually are referred to as "scale" are highly heat resistant. As heat is transmitted through scale by conduction, the result of even a very thin coating will be a considerable diminution of the rate at which heat can enter the liquids and, therefore, in order to maintain the same rate of heat flow, a higher temperature must be maintained on the walls of the heating elements. This requires more fire. Lowering of the rate of transmission allows the metallic heating wall to become heated to a higher temperature than it would have attained if its liquid side had been clean. As the accumulation becomes thicker the temperature of the heating wall becomes higher until the point is reached where it burns through. There is absolutely no way that this may be prevented other than to periodically clean the heating surfaces.

It is conceivable that when heavy hydrocarbons contact the highly heated surface there will be a distillation of the lighter parts and coking of the heavier parts on the hot surfaces. This will also build up the same as salt and scale and form a non-conductive medium through which heat must be transmitted to the liquids, and which will act in the same way as other scales and require more heat for the same output, likewise coming to the point where the heating surface will burn through if not cleaned before the conditions becomes serious.

While these deposits will form on any heating surface they form most rapidly in the spots of highest temperature, and it is therefore desirable to keep the heat transfer surfaces at as low a temperature as possible.

Cleaning also is needed on the combustion side of heating surfaces. Where good combustion is not maintained, an accumulation of soot will cut down the efficiency of operation, although it may not cause the surfaces to burn through.

Close Heater Tubes

Deposits in a heater, especially in the bottom, may be due to a combination of salt, carbonates and heavy hydrocarbons. This can readily involve such volume that the heater tubes, if it be that type heater, might become closed. The carbonates will act to form a cementing compound to bond the salt and coke into a solid mass which can only be loosened by force or by the use of some material such as hydrochloric acid to break down the cement bond.

The accumulation of salt, scale and coke from hydrocarbons will vary in different locations, depending on the composition and concentration of the brine, emulsified oil present, the type of the emulsion treated, the viscosity of the oil, carbonates and sulphates present, temperature changes involved and the rate at which heat is applied. The accumulation of basic sediment, coked heavy ends of the crude, etc., which by itself or accelerated by the accumulation of salt which has identically detrimental effects, will also depend on the type of crude oil heated. Consequently, it is impossible to establish one universal rule as to how often cleaning must take place. This must be determined by trial for each particular installation, and the only rule that may be laid down beforehand is that the heater or emulsion treater must be kept clean, and that certainly an accumulation of any kind on the heating surfaces, whether salt, coke, hydrocarbons, scale or soot, in excess of ¼-inch should never be permitted.

In boilers, ⅛-inch of scale may be considered excessive. Compare this, where heat transfers range from 2000 to 4000 Btu per square foot, per hour, to oil-field-emulsion heaters and emulsion treaters where heat transfers in some cases range to over 10,000 Btu per square foot, per hour and one can appreciate the necessity of proper care.

Eliminate Hot Spots

In the design of any heaters effort should be made to eliminate hot spots or areas of higher temperature than the areas adjacent to them in order to equalize the heat distribution uniformly over the whole heating surface. In that way the tendency to deposit material at any one spot is minimized, and the chance of excess temperatures with subsequent burning through under deposit formations is reduced.

It is the manufacturer's responsibility to design heaters and emulsion treaters so as to minimize the possibility of deposits forming and also to provide ready and convenient means for cleaning off the deposits. It is definitely the operator's responsibility to clean off the deposits at regular intervals before they become so great as to cause burning out of the heating elements. When a heating element fails by burning out, it will almost invariably be found that it was caused by allowing an excessive accumulation of deposits.

While we have said that the ideal condition of design to entirely prevent the depositing of materials in heating equipment cannot be attained, it is possible by considering various means of heat transfer to distribute the heat uniformly over the heating surfaces so that it is transmitted to the fluids at an equal rate from all parts of the heating surfaces. Oil-field

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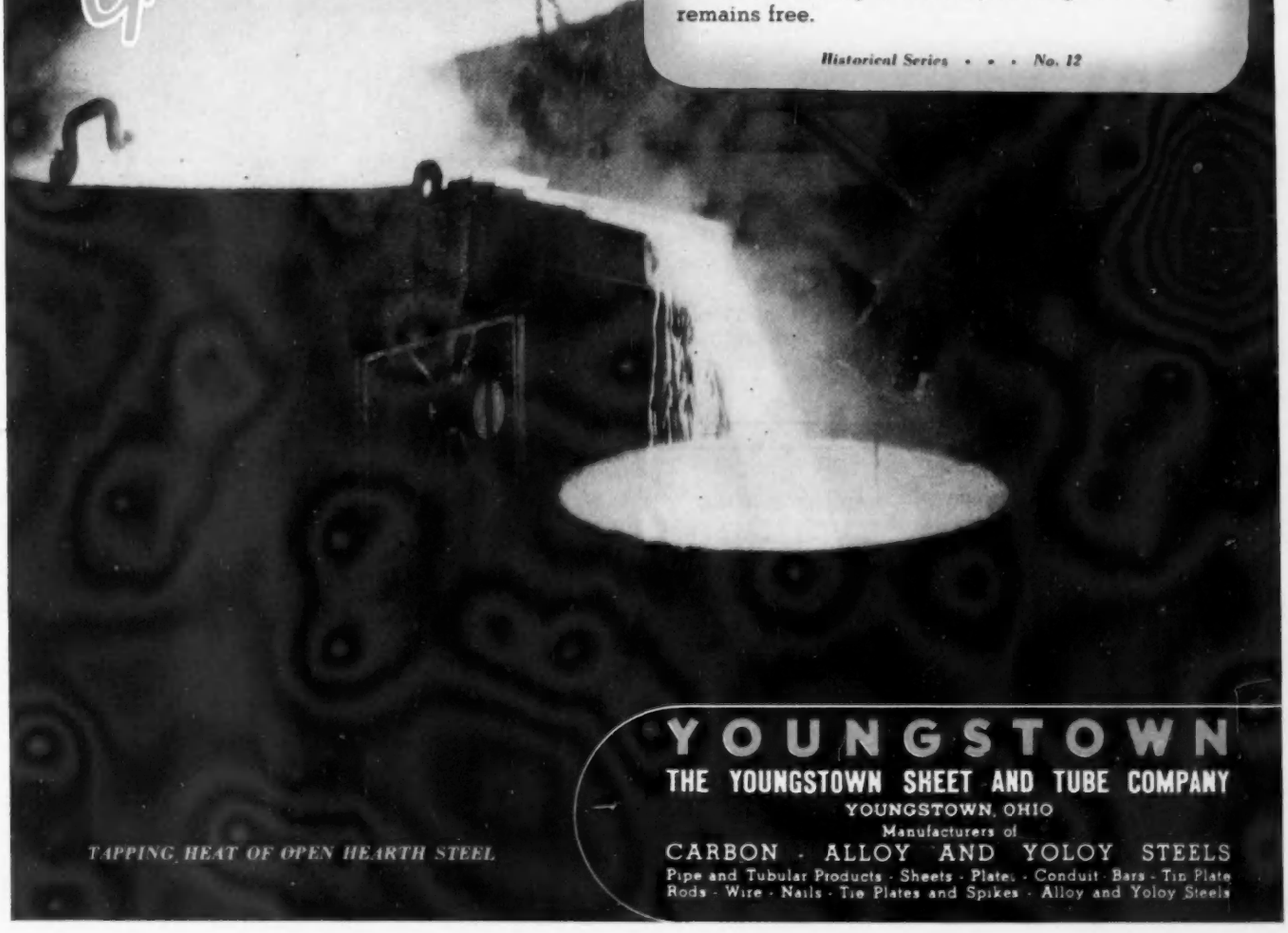

TAPPING HEAT OF OPEN HEARTH STEEL

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heaters, and emulsion treaters that are designed for uniform heat distribution and transmission to the fluids to be heated are available to the industry. An effort is also made to distribute the fluids entering the heater so that their temperatures are approximately equal whenever they contact the heating surfaces. In addition, as oil or emulsion is lighter than the water with which the shell eventually becomes filled, the oil is heated indirectly in passing upward through the hot water in small streams rather than by its contact with the hot surfaces. This lessens the tendency for coke formation.

Radiant Heat Used

One such heater (Figure 1) employes a method of obtaining uniform heating tube temperatures by using radiant heat in combination with heat transfer by convection and conduction. The heating element consists of a long cylindrical tube closed at the inner end, inserted into the heater shell through the head at one end. Into this tube is inserted a sufficient number of short interlocking sections of special high-temperature cast-iron rings to continuously extend nearly to its rear end. Cast on the outside of the cast-iron ring sections are lugs which space the cast-iron tube concentrically within the steel heating tube. This construction provides a passage for the flame from the burner through the interior of the cast-iron tube, which acts as a combustion chamber, to the rear end, and a passage for the return of the gasses to the stack between the exterior of the cast-iron tube and the interior of the steel heating tube. At the closed end of the heating tube is cast a refractory plate to protect the metallic end against direct impurgement of the hot gasses upon it.

Combustion starts as the mixture of gas and air leaves the burner spider and is completed in the foremost part of the cast-iron-ring section. As the hot gasses pass to the end of the cast-iron rings, a turbulant spiral flow is promoted by lugs cast integrally with the interior of the ring sections, these sections being assembled so that the lugs are in staggered relationship with each other. The hot gases wiping the walls of the cast-iron tube heats the tube to incandescence and the resulting radiant heat passes directly to the heating tube and into the fluid surrounding it. The hot gasses having passed to the rear end of the cast-iron tube, return between the outside of the cast-iron tube and the inside of the heating tube in which space they are also given a turbulant spiral flow by the staggered lugs cast integrally on the outside of the cast-iron tube sections. This space is so restricted as to give a high velocity to the hot gasses, and this, with the spiral turbulant action, causes the gasses to wipe the walls of the steel heating tube as they travel back to the breeching, resulting in a high percent of the heat in these gasses being conducted through the heating tube and into the surrounding fluid by convection and conduction.

Even Heat Distribution

As is apparent, the hottest part of the flame within the cast-iron tube is near the burner and as a consequence the amount of radiant heat developed and absorbed by the surrounding fluid gradually decreases along the length of the tube. But in flowing back along the outside of the cast-iron tube, the hottest gasses are at the rear end and as a consequence the amount of heat transmitted to the surrounding fluid by convection and conduction gradually decreases toward the front of the tube. Thus, the combination of transfer of heat by radiation and by conduction and convection results in an even distribution throughout the length of the tube, more heat being absorbed by convection in the rear of the tube than by radiation.

The use of radiant heat sections is becoming increasingly common in the design of all types of industrial and power-plant boilers, and radiant heaters are to be found in practically every home. When a surface is heated to incandescence by a flame or by an electric current, that surface converts the heat into high-frequency waves similar to radio waves. These high-frequency waves pass freely through a gas, giving up little or none of their energy in so doing. As a consequence, the air or gas through which they travel is not heated. On striking a solid surface, however, the energy in these waves is immediately reconverted back into sensible heat. The common home type of electrical radiant heater illustrates this method of heat transfer. If such a heater is placed in a large cold room it will be noted that the temperature of the air in front of the heater is not raised. However, if any solid body such as a chair, piece of steel or one's hand is placed in front of the heater, the waves in striking the surface are transformed into sensible heat and the temperature of the surface rises.

In a heater such as is illustrated in Figure 1, the waves thrown off from the hot radiant surface of the cast-iron sections pass freely through the envelope of gas flowing back between the cast sections and the steel tube and in striking the steel tube with its surrounding fluid are converted back into "sensible heat" and the fluid temperature is raised.

Elimination Not Possible

Even though such features as these may minimize the possibility of deposits forming on the heating surface or reduce the rapidity with which they form, they can not eliminate them entirely. Nor can they eliminate the depositing of material elsewhere in the heater. It remains the operator's responsibility to clean off such deposits as do form before they become great enough to cause burning out of the heating element or clogging of the heater shell.

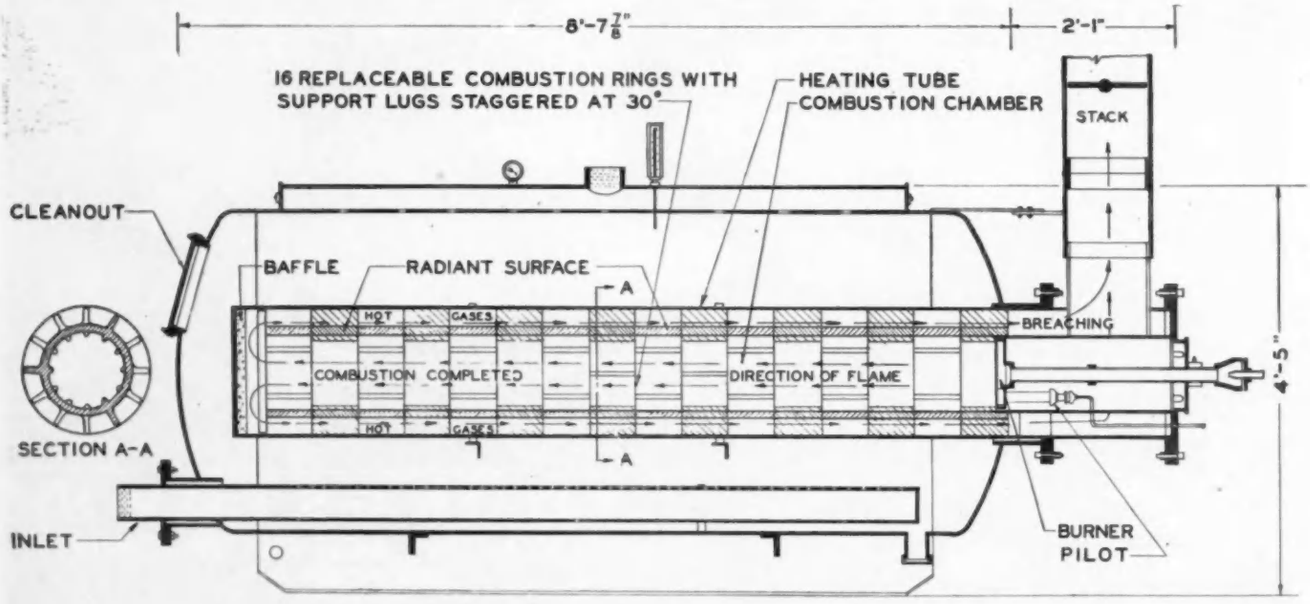

FIGURE 1

A 350,000 Btu horizontal heater that employs radiant heat in combination with heat transfer by convection and conduction to provide uniform heating-tube temperatures.

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Its Effects on Recoveries and Profits

By STUART K. CLARK, Assistant Chief Geologist, Continental Oil Company, Ponca City, Oklahoma
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In Two Parts
PART II

SOME of the conditions affecting production from the Wilcox Sand, Oklahoma City field, mentioned at the conclusion of Part I (THE OIL WEEKLY, Feb. 21, page 11) merit brief discussion in that they afford an opportunity for a study of the effects of erratically varying spacing within a productive area. The comparisons, as noted were made by computing spacing and recoveries by quarter sections; grouping them by 4-acre spacing increments as follows: 0 to 4 acres, 4 to 8 acres, 8 to 12 acres and over 12 acres, and averaging the spacing and recovery per acre-foot for those groups. (Table 4, page 15, THE OIL WEEKLY, Feb. 21.)

The production occurs in a truncated sand body on the flank of the anticline. In cross section normal to the strike of the beds, the pay sand represents a prism, as shown in Figure 5, bounded by the upper and lower surfaces of the sand, the original water level and the unconformity at the base of the Pennsylvanian. Total thickness of the sand is about 225 feet.

A, B, and C indicate wells penetrating the pay, respectively, near the up-dip edge, in the middle of the productive zone, and near the down-dip edge. It is evident that wells near the up-dip edge produce from the lower portion of the sand, those near the middle from almost the entire sand body, and those near the down-dip edge produce from the upper part of the sand only.

Obviously the wells in the up-dip portion of the productive zone are in the best position to benefit from any up-dip drainage that may occur.

The areal extent of the productive area is indicated by the map, Figure 6.

It happens that for the major part of its length, the productive area extends due north-south and is practically spanned by two adjacent rows of quarter sections. If recoveries per acre-foot of sand and well spacings are computed by quarter sections and posted on the map, it immediately becomes apparent that of adjoining quarter sections in these two rows, that the up-dip side invariably has the higher recovery regardless of well spacing.

At first glance this would seem to be evidence of up-dip drainage on a large scale. However there are certain other facts that tend to cast doubt on that conclusion. There has been no active water drive in this sand. Many wells near the up-dip edge have been depleted and abandoned. The pressure has been reduced to near atmospheric and drainage into the presently producing wells appears to be by simple gravity flow. Furthermore the phenomenon of higher yield from the up-dip quarter sections persists on up through the Mansion area where the pressure had been reduced to about 700 pounds during the years before the development of that area began.

All this suggests that the bottom half of the sand is inherently a better pay zone than the top half.

Plotting the data for the 4-acre increments for the entire sand body and the "up-dip" and "down-dip" quarter sections, respectively, on the well spacing-recovery chart, gives the first three graphs shown in Figure 7.

The three curves all have one characteristic in common. That is, that they have a steeper slope than that indicated by the overall averages and there is a slight tendency for the slope to increase as well spacing diminishes. In other words, the increase in recovery with closer spacing is greater than would normally be expected.

The range of recoveries even for these 4-acre increments is extremely large, ranging from 325 barrels per acre-foot for a spacing of 13.25 acres per well, to 1315

In the first installment of this article on well spacing (*The Oil Weekly*, February 21) the underlines for Figures 1 and 2 were transposed. Figure 1 in reality showed spacing in the Lucien field whereas Figure 2 showed experience in the Chase Townsite pool.

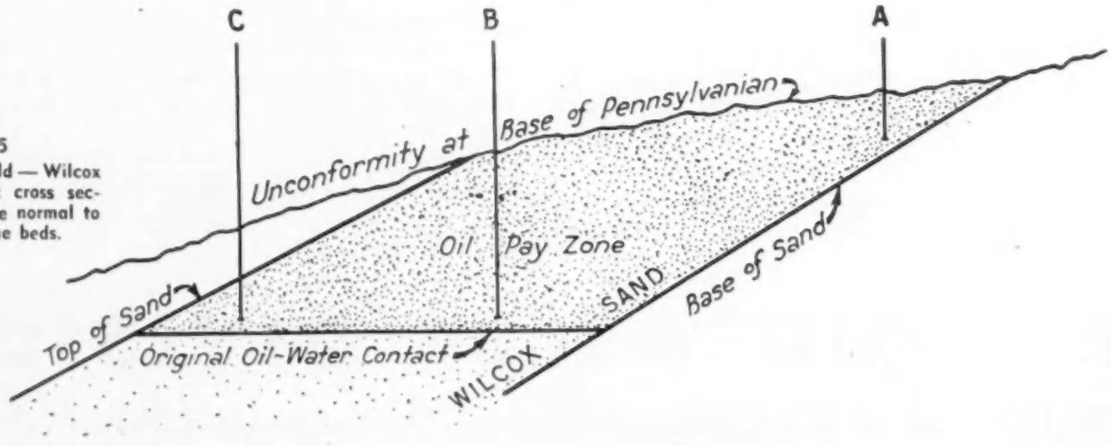

FIGURE 5
Oklahoma City field — Wilcox sand Diagrammatic cross section of oil pay zone normal to the strike of the beds.

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barrels per acre-foot for a spacing of 3.25 acres per well for the entire Wilcox area. Individual quarter sections, of course, show an even wider range.

The data for the later developed Mansion area, plotted on the well spacing-recovery chart, Figure 7, indicate an average recovery some 14 percent lower than that of the entire sand body; but some 22 percent higher than the average of the down-dip quarter sections. The recovery curve approaches the normal expectancy line for the area more closely than any of the other three curves; but even it shows a slightly steeper slope than the normal expectancy line.

The phenomenon of steeper-than-normal gradients on the well spacing-recovery curves for intra field groups also is evident in Figure 8, in which the production from the Texas fault line fields has been broken down by spacing increments within the fields. With the exception of Wortham, the deviations from the normal-expectancy line are slight; but all the deviations are toward a steeper gradient rather than a flatter one.

This indicates that for the intra-field spacing groups, the more closely spaced wells tend to be benefited; and the more widely spaced ones penalized to a greater degree than would be expected from the inter-field comparisons. In other words, that with varied spacing within a field, the closely spaced wells gain an additional advantage at the expense of the widely spaced ones. The steepening of the gradients of the intra-field curves provides an index of the extent of that effect.

Comparison of the Oklahoma City curves with those of the fault line fields indicates that proration as practiced at Oklahoma City tended to aggravate that effect rather than to mitigate it.

Much additional evidence offering support for the proposition that closer spacing does mean increased recovery might be added. But enough has been presented to establish not only the fact of increased recovery with closer spacing, but that of a definite mathematical relationship between the two. The evidence shows that within the range of ordinary experience this relationship holds, not only for shallow fields and wide-open producing conditions, but for comparatively deep production developed with relatively wide spacing and operated under proration with it's restrained rates of production.

The mere fact that this simple relationship obviously cannot continue to hold throughout the entire range to infinity in the direction of closer spacing, does not invalidate it for use within practical limits. In this respect, it is analagous to the laws of gases which are useful tools within the critical temperatures and pressures which limit their application.

That mathematical relationship is presumably an index of the unavoidable losses inherent in any system of oil field development in which recovery of the oil depends upon forcing it to a series of isolated points within the reservoir; i.e. the drill holes penetrating the sand, in somewhat the same way as entropy is a measure of the inescapable loss in any heat-power engine. It seems obvious that some loss is inevitable in the oil-well method of exploitation as compared with actual mining of the sand and washing it free of oil, or as compared with pumping oil through a pipe line.

Probably a substantial part of the increased loss accompanying wider spacing may be attributed to the fortuitous location of the drill holes in the reservoir with respect to the areas of exceptionally high porosity and permeability in sandstones or the naturally developed drainage channels in limestones or dolomites. All reservoir rocks vary laterally in some degree. As a consequence, individual wells vary greatly in their productive capacities. One well often will yield as much as half a dozen of its neighbors. At the other extreme are the

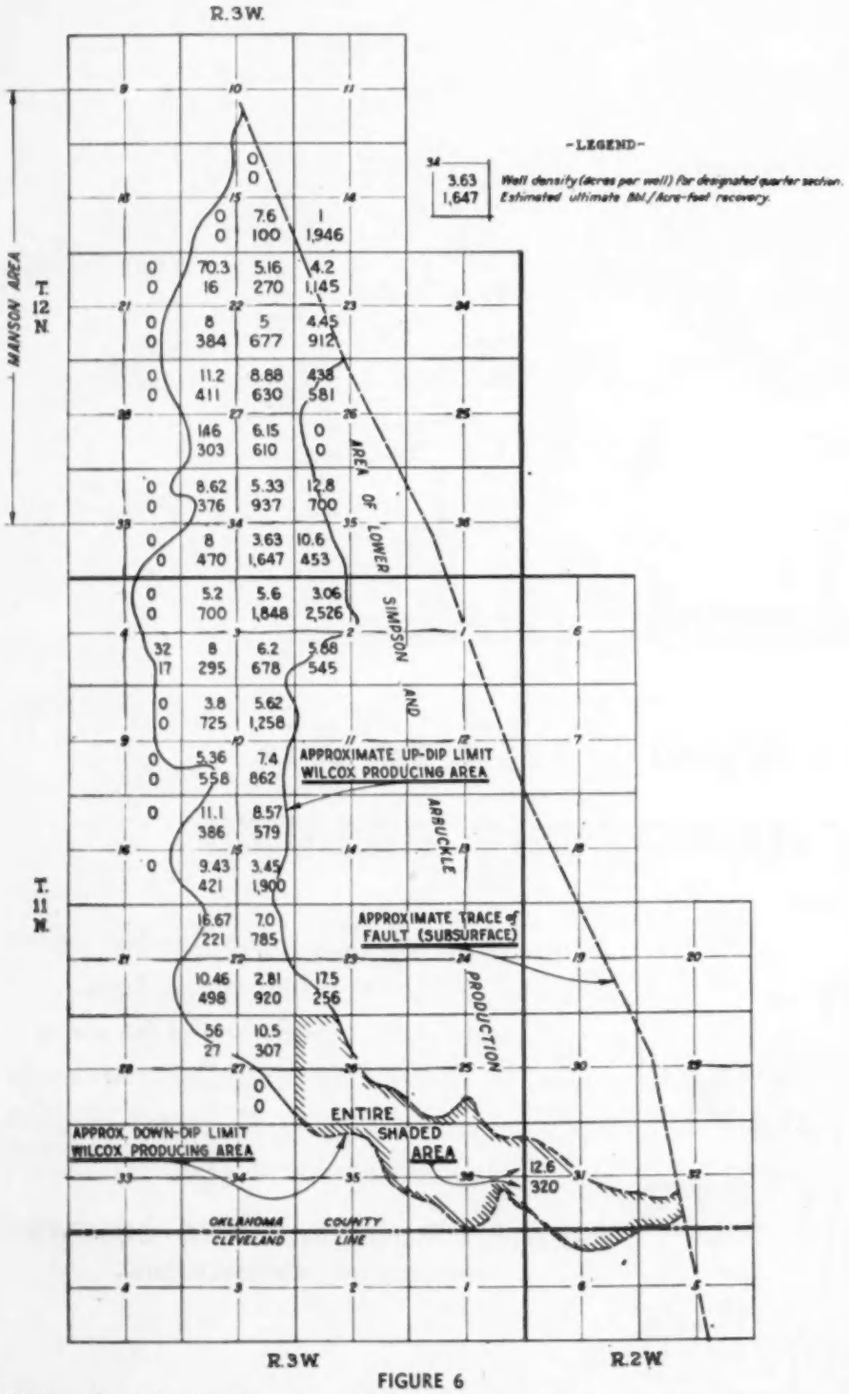
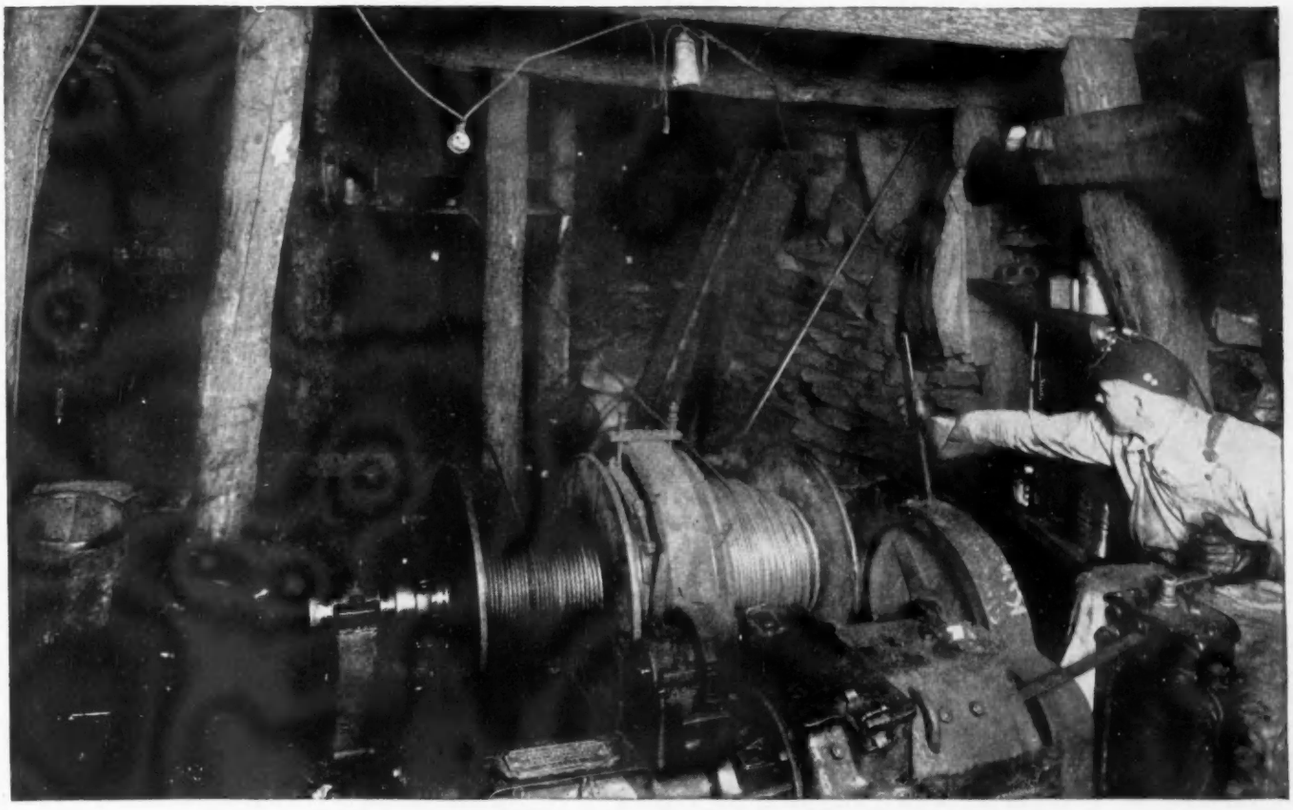


FIGURE 6

Oklahoma City field Wilcox sand zone. Estimated ultimate volumetric yields by quarter sections.



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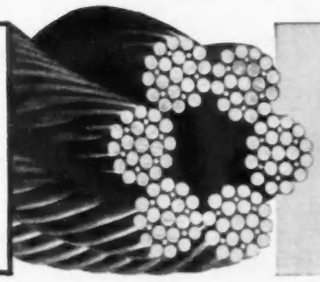

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dry holes which are occasionally completed in the hearts of fields due solely to local impermeable areas in the producing horizon.

The odds against tapping all the local "sweet spots" naturally increase as well spacing widens, and no doubt that fact is reflected in the lower average recoveries per acre-foot indicated for more widely spaced wells.

It is not necessary to undertake an exhaustive analysis of the problem of radial drainage to visualize other reasons for such losses. Pressure gradients along any radius through a producing well are steep in the immediate vicinity of the hole and flatten out rapidly with increased distance from it. The pressure divides between wells may be visualized as almost imperceptible reversals rather than sharp ridges.

In the case of exclusively solution-gas-drive fields for instance, it is inconceivable that the oil along these pressure divides could ever be moved to the wells by the energy originally available in the reservoir.

In the case of water-drive fields where water from outside the original oil accumulation is available for replacement of fluid removed and provides a source of replenishment of energy, we should expect a greater recovery than in the gas-drive field. However, pressure divides between wells will still exist, and movement of the water toward the wells will tend to be along the steepest pressure gradient and accordingly the shortest line.

Figure 9 illustrates a situation in which wells 1, 2, 3 and 4 are equally spaced and are equidistant from the original oil-water contact line A-B at the top of the producing sand. Bearing in mind that oil in the majority of natural reservoirs does not have the same freedom of movement as in an open vessel, but must be moved through openings of capillary size at an appreciable expenditure of energy, it seems evident that after a lapse of time the oil-water contact would tend to assume the position indicated by the broken line C-D.

Such lobes in the advancing water front would tend to become further accentuated as production continues, with the result that some oil along the pressure divides would presumably eventually be by-passed entirely even in an

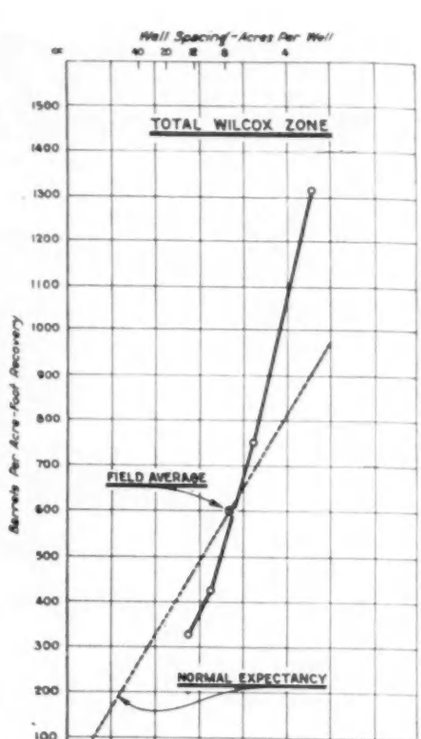
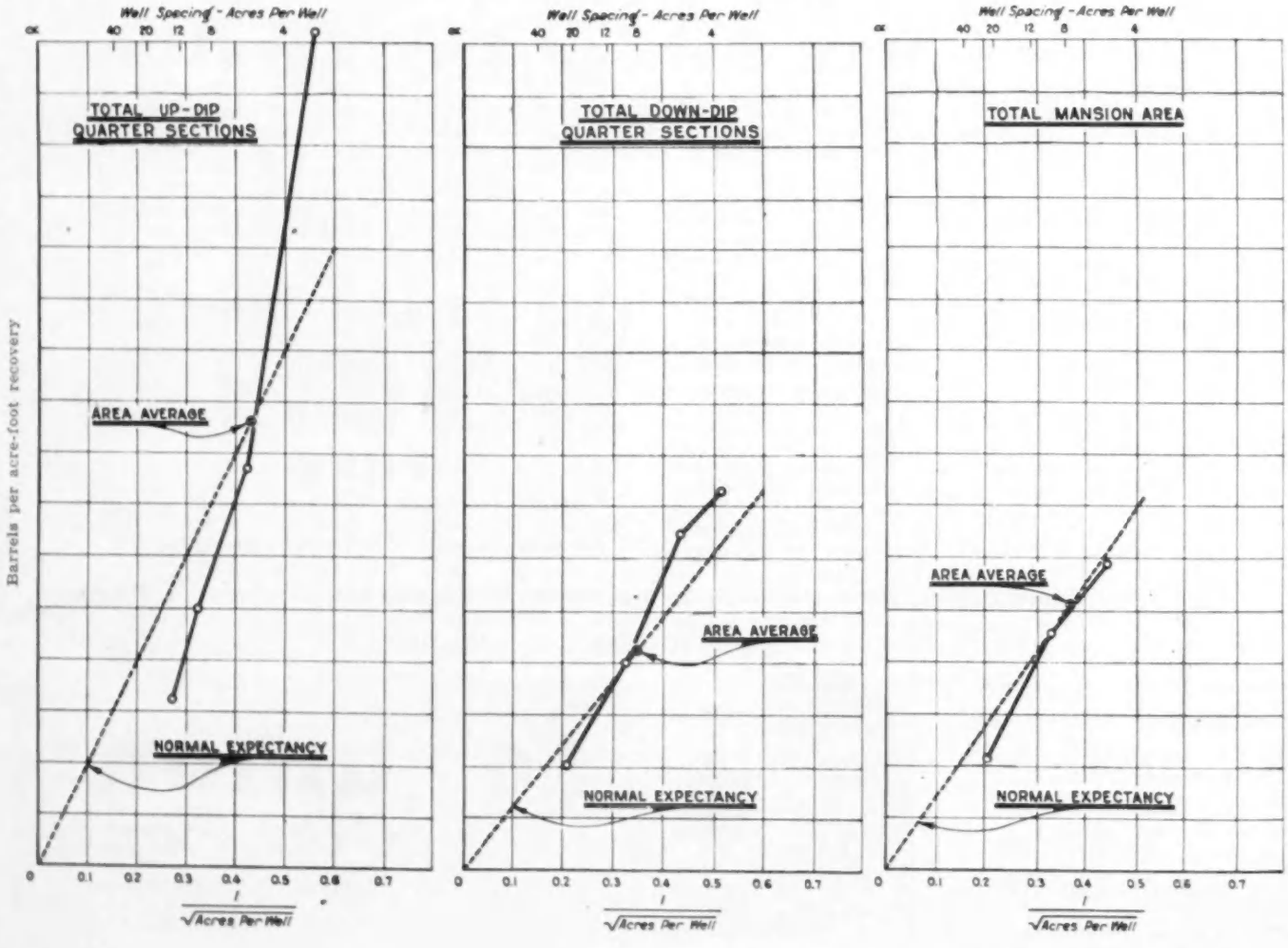


FIGURE 7

Oklahoma City field—Wilcox sand zone. Estimated ultimate recoveries calculated by quarter sections and grouped in spacing intervals of four acres per well.



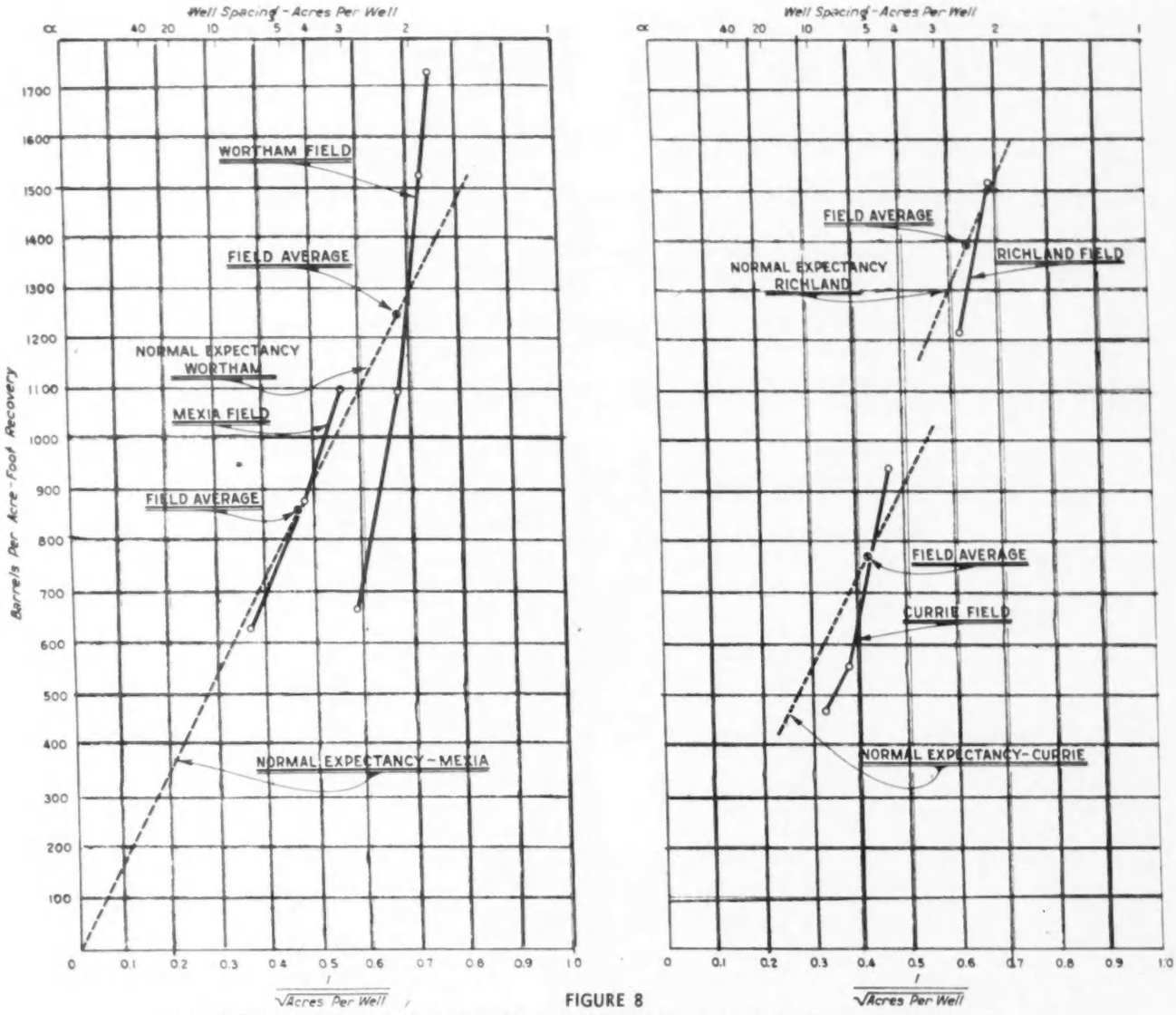

Well Spacing - Acres Per Well
∞ 40 20 10 5 4 3 2 1
Barrels Per Acre-Foot Recovery
WORTHAM FIELD
FIELD AVERAGE
NORMAL EXPECTANCY WORTHAM
MEXIA FIELD
FIELD AVERAGE
NORMAL EXPECTANCY - MEXIA
1700 1600 1500 1400 1300 1200 1100 1000 900 800 700 600 500 400 300 200 100
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
1/√Acres Per Well
Well Spacing - Acres Per Well
∞ 40 20 10 5 4 3 2 1
FIELD AVERAGE
NORMAL EXPECTANCY RICHLAND
RICHLAND FIELD
FIELD AVERAGE
CURRIE FIELD
NORMAL EXPECTANCY - CURRIE
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
1/√Acres Per Well

FIGURE 8

Intra-field spacing-recovery relationships, Texas fault line fields, showing effects of spacing on recovery within individual fields.

ideal sand with uniform porosity and permeability throughout. In actual practice, of course, both lateral and vertical variations in the reservoir rock generally prevent the development of anything approaching a uniform water front moving through the sand, which, of course, tends to aggravate the matter of by-passing.

It also seems evident that the lobes pictured in Figure 9 would tend to be the more strongly developed, the greater the distance between wells; although it would require infinitely close spacing: i. e., trench rather than well exploitation, and consequent linear rather than radial drainage to eliminate them entirely.

Granting the hypothesis that the indicated mathematical relation between well spacing and recoveries is an index of the inherent inefficiency of the well system of oil-field development, there is no justification for the assumption that that relation can be destroyed by the adoption of different production practices.

Certainly restraint of the rate of pro-

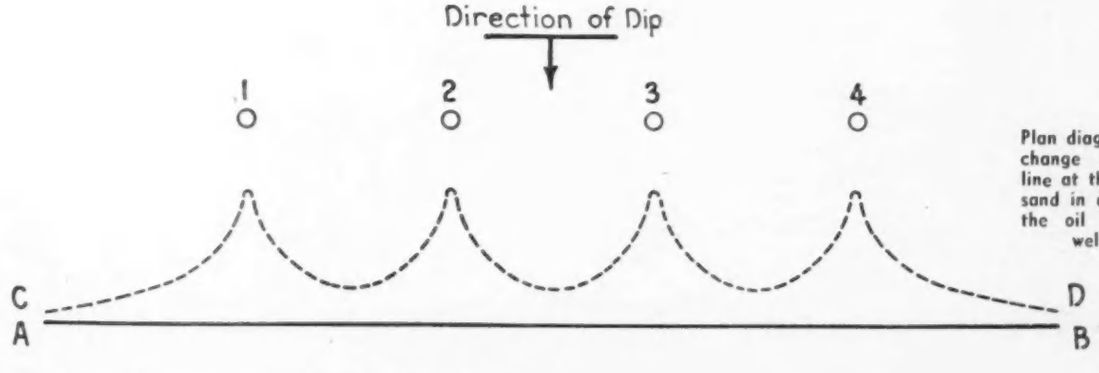


FIGURE 9

Plan diagram showing probable change of oil-water contact line at the top of a producing sand in a water drive field as the oil is produced through wells 1, 2, 3 and 4.

duction as practiced at Lucien did not affect it materially.

Nor is there any reason to think that repressuring by the recycling of casinghead gas, the introduction of gas from extraneous sources, or the use of an artificial water drive can wholly eliminate the effect of well spacing. They can effect increases in recovery, it is true; but they all involve the creation of steeper pressure gradients along straight lines from the input wells to the nearest producers than exist along other radii from those producers, with a consequent tendency to by-pass oil along the intervening pressure divides.

Within certain practical limits there is no reason to assume that the adoption of a more efficient production method would not effect an increase in recovery regardless of the existing well spacing.

The total volume of oil originally present in the reservoir constitutes the final limit which all efforts toward increased recovery can only hope to approach. It is highly desirable that the general order of magnitude of the figures as they apply to the unit of reservoir volume be kept in mind. An acre-foot of sand occupies a space approximately equivalent to 7,750 barrels of 42 gallons each.

An acre-foot of sand with a porosity of 25 percent therefore contains void space amounting to 1,937 barrels. If 15 percent of that space is occupied by connate water, that available for oil is reduced to 1,560 barrels. And if 15 percent of the volume of the oil represents dissolved gas, the space occupied by "tank battery" oil shrinks to 1,325 barrels. Those figures convey a fair idea of the outside limitations on the productive possibilities of a sand with 25 percent porosity.

As those limits are approached, it is obvious that further appreciable increases cannot be expected from either closer spacing or refinements in production practice.

A close approach to those limits as a result of close spacing is indicated by the Wortham field recovery of 1,245

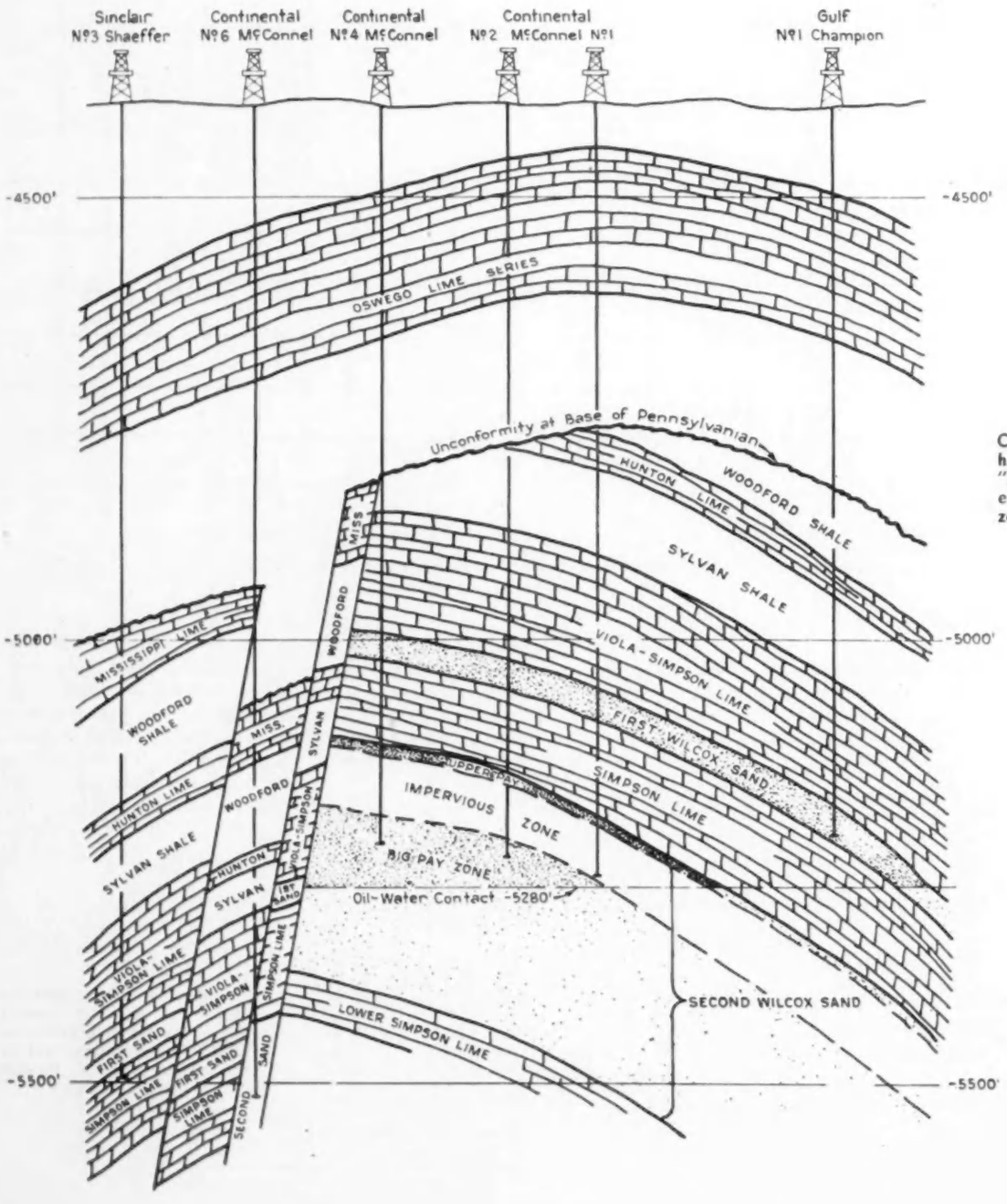


FIGURE 10
Crescent pool, Oklahoma, cross section "A-A" showing limited extent of "big pay zone" in the second Wilcox sand.

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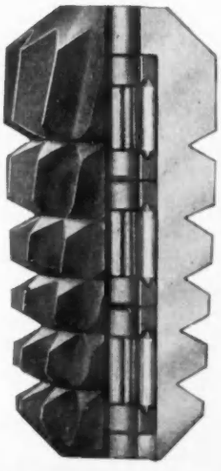

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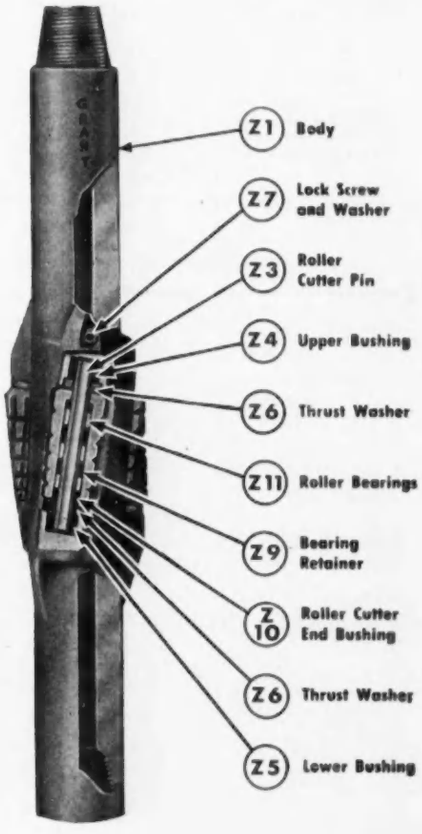

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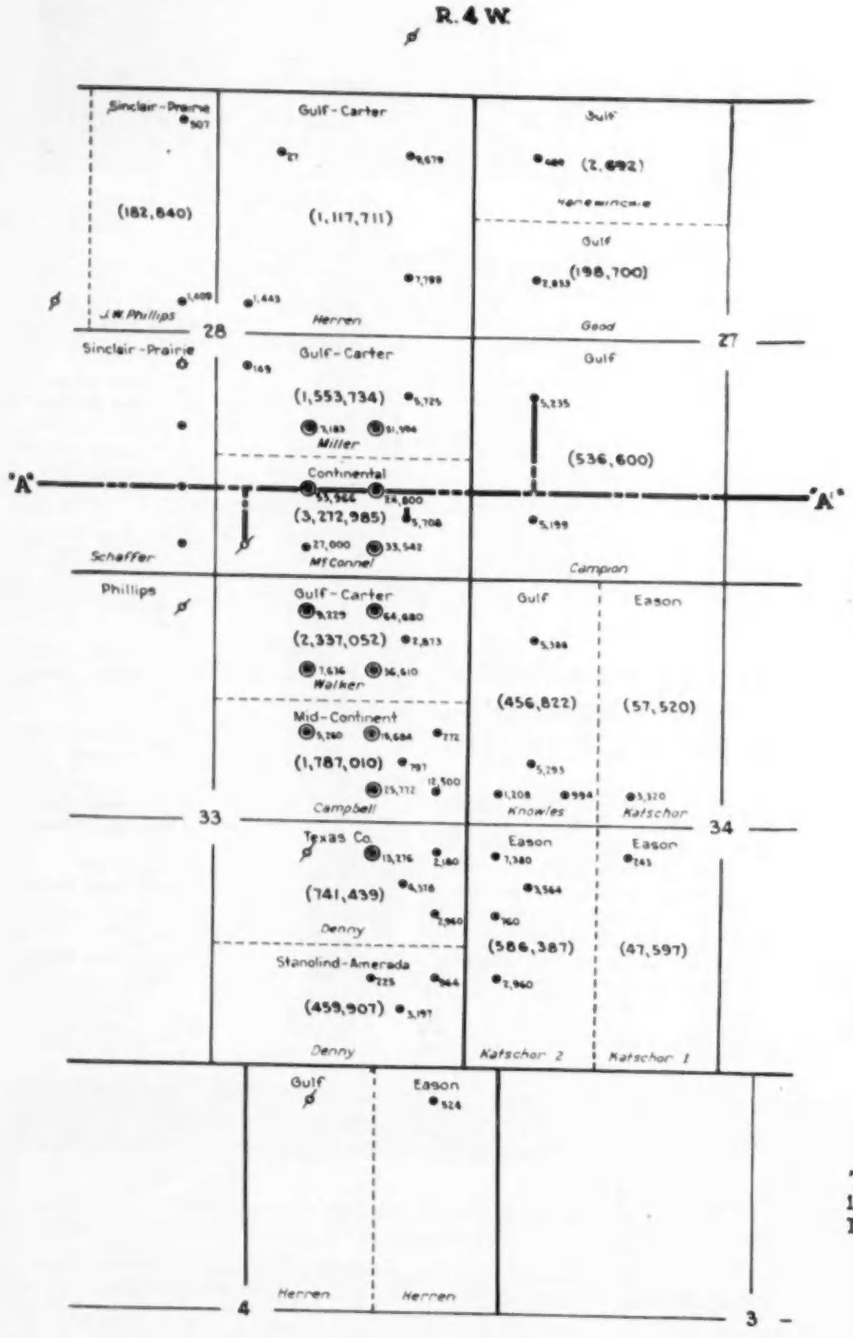
barrels per acre-foot with a spacing of 2.2 acres per well under the wide-open-flow conditions which have frequently been branded as inefficient and wasteful. It should be noted that the increased recovery attributable to closer spacing is a very substantial figure. Thus Wortham's 1,245 barrels represent an increase of 475 barrels or 62 percent over the 770-barrel recovery at Currie. The total indicated gain at Wortham amounts to 8,950,000 barrels.

It should be obvious that any improvement in production practice which can demonstrate a recovery equal to that obtained at Wortham from a sand of equal porosity with a decidedly wider spacing, will have eliminated any need for consideration of any closer spacing than that then used. Certainly unless they do result in recovery comparable to that obtained at Wortham, porosity and other factors considered, no production practices applied to widely spaced wells can be said to have eliminated all need for considering the possibilities of obtaining additional oil by means of closer spacing.



-LEGEND-

- ● - Wells completed in first Wilcox or top of second Wilcox.
- ⓦ - Wells completed in "Big Pay Zone" of second Wilcox.
- 2,875 - Initial potential - 24 hour.
- (57,520) - Lease cumulative production to July, 1943.

FIGURE 11

Crescent field—Oklahoma, Wilcox sand development only, showing wells which penetrated "big pay zone" in second Wilcox horizon; initial production by wells and cumulative production.

All the foregoing discussion has considered only the effects of spacing within the field. If all fields were limitless in extent, no other factor would need consideration. But oil fields are limited in area; and authorities agree that the average size of fields discovered in the United States during recent years has shown a persistent decline. This decline in field size, coupled with arbitrarily imposed wide spacing patterns which now generally prohibit drilling more than one well to 40 acres, has created additional problems which cannot be ignored in any study of the economic effects of well spacing.

One of these is the problem of obtaining locations actually capable of draining structually controlled accumulations in fields of small areal extent under arbitrary wide spacing patterns. This includes narrow accumulations against faults, where adequate development becomes a veritable nightmare under existing spacing regulations, and all sharply folded anticlines and domes of small extent.

The nature of the problem may be indicated by carrying it to an extreme for illustrative purposes. If the regulations specified that only one well could be drilled in each section of land, and that it must be located at the center of the section, it is evident that many small fields could not be exploited at all because of the impossibility of finding any location on the regular pattern which would fall within their limits.

The same difficulty in principle arises when an operator attempts to select locations on a rigid, uniform 40-acre spacing pattern to exploit a given pay zone in a narrow fault-trapped fie'd.

The Wilcox-sand production in the Crescent field, Oklahoma, furnishes a perfect illustration of the problem as it applies to a narrow sharply folded and faulted anticline. It is a particularly pertinent example because the field development was initiated on a 40-acre spacing, but was subsequently switched to a 10-acre pattern as a result of vigorous protests by some of the operators affected.

It happens that the axis of the structure in the Ordovician rocks runs practically due north-south. Consequently the east-west cross section, Figure 10, indicates the relative positions of the north-south rows of 10-acre and 40-acre locations, respectively, that are closest

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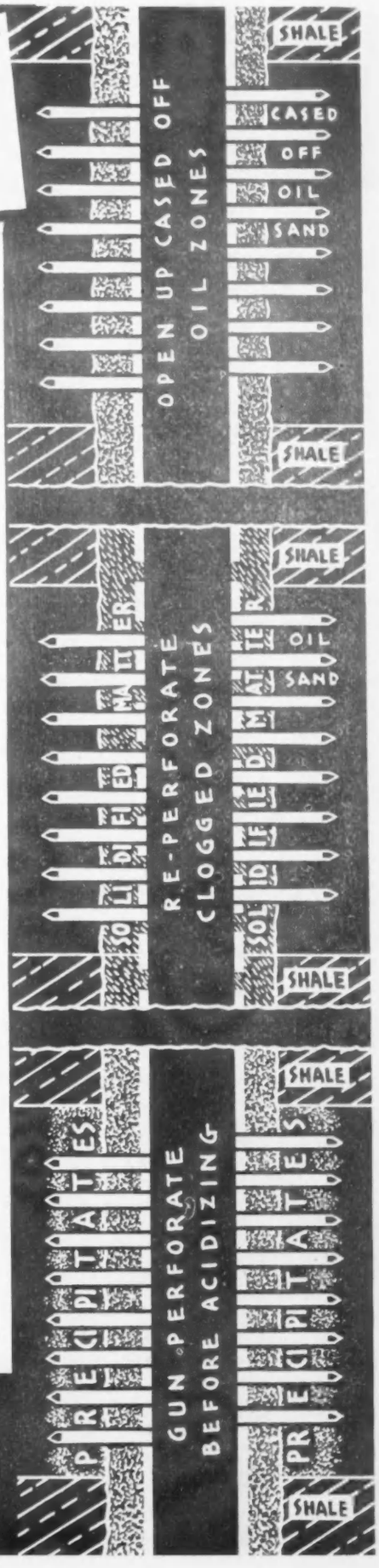

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to that axis. The Second Wilcox sand in this field included a tightly cemented practically impermeable zone below its upper pay zone. Beneath that tightly cemented zone was a lower pay of exceptional calibre in which initial productions ranging up to 64,000 barrels per day were obtained.

Only the two rows of 10-acre locations along the crest of the structure produced from the prolific lower pay zone. Those producers are indicated and the initial productions of both the First and Second Wilcox sand wells are shown in Figure 11.

Production from the leases shown has amounted to 13,338,996 barrels. While segregated production figures are not available, it seems probable that more than half of the total was obtained from the extremely productive lower pay zone which would never have been tapped at all if the original 40-acre spacing had been adhered to throughout the development.

The particular difficulty of selecting structurally satisfactory locations on a rigid spacing pattern could be mitigated materially without increasing average well density by a simple ruling, that equal density of development does substantial justice as between adjoining operators and royalty owners and consequently that having established the density by fixing the area to be included in a drilling unit, all further restrictions, as to where within that unit the well may be drilled, will be eliminated. In fact, such a ruling seems essential as a matter of justice to both operators and royalty owners.

Another problem created by wide spacing lies in the increased ratio of dry holes to producers drilled in developing a given field. As field area diminishes, that ratio tends to increase, well spacing being constant. The extreme case is that of the one-well pool with dry holes offsetting it in each of the four cardinal directions. That situation will naturally be reached sooner with a wide spacing pattern than with a close one as field size declines. The same tendency exists in fields of greater extent. So with decreasing field size and increasingly wider well spacing, a large increase is inevitable in the percentage of total footage drilled which goes into the unproductive holes required to determine the limits of a field.

If one well will not effect the same recovery as a number of wells will from a reservoir, regardless of size, then there is a definite loss involved in this increasing percentage of dry-hole footage which serves to offset or cancel out a part of the apparent saving in development cost credited to wider spacing.

Discussions of the effect of well spacing on profits in recent years have for the most part assumed that recovery would be independent of spacing and consequently that the reduction in development cost effected by widening the spacing is all net saving. If this were literally true, there would be no justification for drilling more than one well in the smaller fields.

There has also been a tendency to focus attention upon development costs (in terms of cost per producing well only) and profits per dollar invested (with the same restriction as to investment items). Such a presentation of the subject gives a very seriously distorted picture. It is heavily "loaded" to favor wide spacing since "development cost," figured on a flat price per well, increases in direct ratio to the number of wells drilled; whereas the recovery of oil increases only in proportion to the square root of well density.

There is little excuse for such distortion of the facts, since the actual possibilities for reductions in costs through wider spacing should be sufficient argument for the adoption of as wide a spacing as is practicable and economically sound.

It is the further purpose of this discussion to indicate the factors which must be taken into consideration to arrive at any fair appraisal of what is practicable and economically sound.

Those factors are:

1. The recovery per acre obtainable;
2. The price of the oil;
3. The cost of finding and acquiring each productive acre (including the cost of condemned acreage and exploratory dry holes);
4. The cost of development per productive acre, (including probable cost of dry holes drilled to define field);
5. The probable cost of producing the oil;
6. The practicability (as a physical possibility) of adequately exploiting a particular accumulation with a given spacing pattern.

Total recovery per acre for a known thickness of pay may be estimated with the aid of the Recovery-Well Spacing Chart, using a point established by known recovery for one spacing from a closely comparable reservoir operated under similar conditions, and the zero point of the chart to determine a line along which unit recoveries for other spacings may be read. Multiplying those figures by the pay thickness will give the total recovery figures.

The price of oil used would normally be the prevailing field price. However it may at times be desirable to extend the investigation to include the effects of a range of prices. And under conditions of extreme depression or boom, it would be advisable to use a price representing the reasonable expectancy over a long period of years.

The cost of finding and acquiring each productive acre has generally been ignored in studies of the economics of well spacing. But to do so is to assume that an unlimited supply of oil fields is available upon which an operator may move at will and begin exploitation with no prior expense.

Nothing could be farther from the truth. The proven but undeveloped leases available to any operator for exploitation are definitely limited in number. On the average they represent a large investment in the form of scouting, land, geological, and geophysical expense, lease bonuses and rentals and unsuccessful wildcat tests. Certainly if an individual company is to remain in business and the industry as a whole is to remain solvent, all these costs must be returned out of the operating profits from the productive leases.

Furthermore these items in total represent a flat charge per acre *which accordingly becomes an increasing charge per well as spacing is widened.* To illustrate with the simplest possible case, if an individual with no other investment in the oil industry were to buy a proven but undeveloped lease on 160 acres at a cost of $2,000 per acre, that bonus cost would represent his entire "finding and acquisition cost!" The entire amount obviously must be returned out of net revenue from operations on the lease before any profit can be realized.

The amounts of the bonus cost chargeable to individual wells under various well spacings is indicated in the following tabulation:

Total Finding and Acquisition Cost Per Acre	Well Spacing Acres per Well	F. & A. Cost Chargeable to Each Well
$2,000	10	$20,000
$2,000	20	$40,000
$2,000	40	$80,000

Each operator can determine his unit finding and acquisition cost by totaling all land, scouting, and exploration costs, including exploratory dry holes, over a period of years and dividing that total by the number of acres brought into production during the same period. For the industry as a whole, that cost is probably in excess of $1000 per acre.

The cost of developing a given piece of acreage to a given horizon with a given well density can be estimated with a high degree of accuracy. The only comment concerning it that seems necessary is that for a fair comparison for different well densities the items of cost should be broken down into two classes; the cost of the wells themselves, and the cost of the other facilities necessary for the operations. Only

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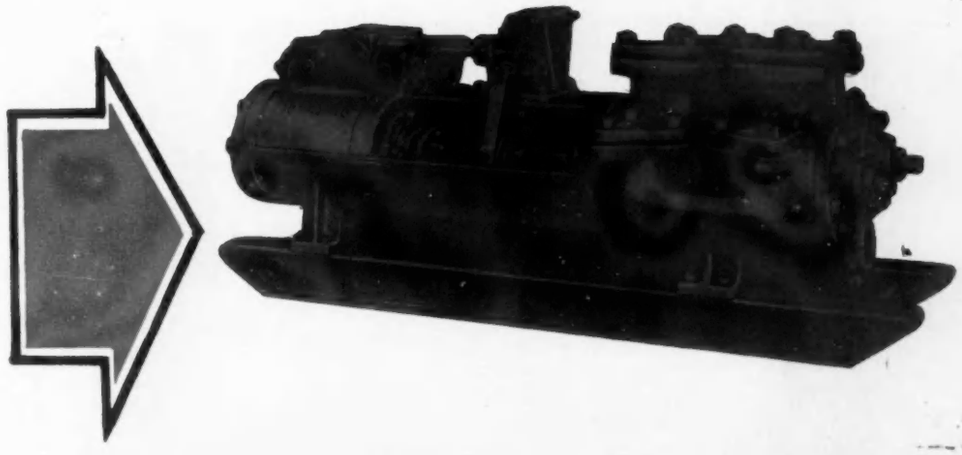

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TABLE 5
Comparison of Effects of Various Well Spacings

ITEM	WELL SPACING PATTERN—ACRES PER WELL			
	40	20	10	5
Number Acres in Productive Area	1,600	1,600	1,600	1,600
Sand Thickness (Average)	35	35	35	35
Recoveries:				
Per Acre Foot	175	250	350	500
Per Acre	6,125	8,750	12,250	17,500
Total	9,800,000	14,000,000	19,600,000	28,000,000
Net Oil to ⅞ W.I	8,575,000	12,250,000	17,150,000	24,500,000
Price (Net After Prod. Tax.)	$1.20	$1.20	$1.20	$1.20
Gross W. I. Revenue	$10,290,000	$14,700,000	$20,580,000	$29,400,000
Costs: Finding and Acquisition at $1,000 Acre	$1,600,000	$1,600,000	$1,600,000	$1,600,000
Development: (Number Wells)	40	80	160	320
Wells at $30,000 each	$1,200,000	$2,400,000	$4,800,000	$9,600,000
Dry Holes 6 at $17,500	$105,000	$105,000	$105,000	$105,000
Other Facilities at $300 per Acre	$480,000	$480,000	$480,000	$480,000
Total Development	$1,785,000	$2,985,000	$5,385,000	$10,185,000
Lifting Costs per Barrel	$0.25	$0.188	$0.147	$0.118
Total	$2,450,000	$2,632,000	$2,881,000	$3,304,000
Total Costs	$5,835,000	$7,217,000	$9,866,000	$15,089,000
Net Profit	$4,455,000	$7,483,000	$10,714,000	$14,311,000
Cost per net Barrel	$0.68	$0.589	$0.575	$0.615
Profit per Dollar of Costs	$0.763	$1.03	$1.08	$0.948

the cost of the wells increases in direct proportion to the number drilled. Other development costs such as tankage, lease houses, warehouses, water systems, etc., are largely independent of the well spacing adopted.

In figuring comparative development costs per acre for various well spacings, the cost of dry holes required to define the limits of production should properly be included.

This may be treated as a constant number of wells for a given field, although in actual practice the number will tend to increase with wider spacing.

Direct lease expense or lifting cost, in contrast to well costs, does not increase in proportion to the number of wells drilled. One-well leases are notoriously high-cost operations. The organization required to operate a field developed on 10-acre spacing is only slightly larger than that required if the spacing is 20 acres per well. Unit lifting costs consequently tend to decline as well density increases; or the additional oil recovered by closer spacing can be lifted at a fraction of the cost per barrel chargeable against that portion of the oil recoverable through the wider spacing pattern.

Determining the practicability, from the standpoint of physical possibilities, of a given spacing pattern for the exploitation of a given field, simply involves an examination of those possibilities in the light of the physical conditions controlling the accumulation. The difficulties involved in attempting to develop small sharply folded structures or narrow multiple-sand accumulations against inclined fault planes on wide spacing patterns have previously been discussed.

Table 5, presents an analysis of the effects of various well spacings in terms of overall costs and profits and in costs per net barrel of oil recovered and profits per dollar of total costs, in a hypothetical case based on assumptions as to field size, sand thickness and productivity, well costs, etc., which are well within the range of ordinary experience.

This analysis takes all of the foregoing factors into consideration. (It is assumed that the dimensions of the productive area are such that it can be exploited by any of the spacings in-

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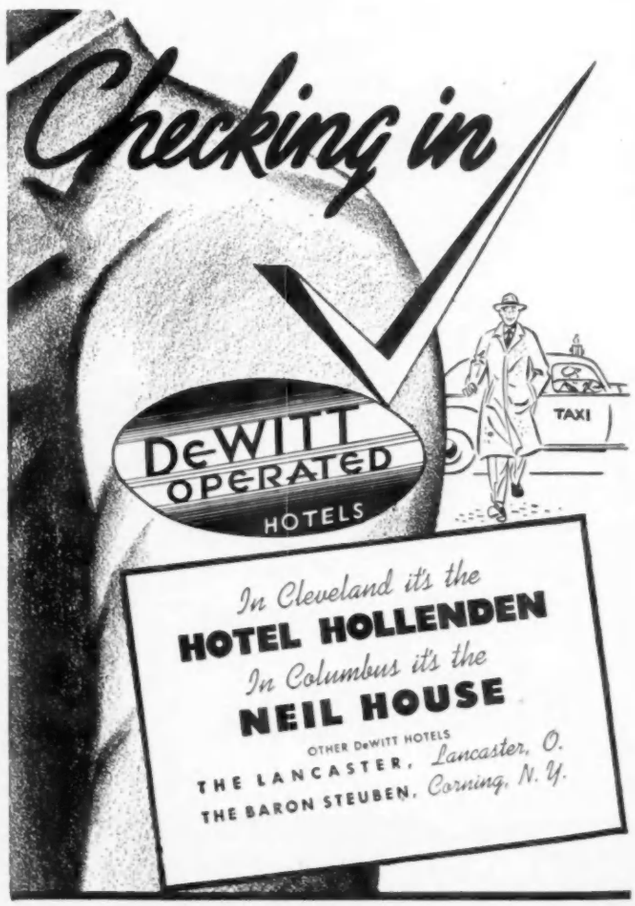

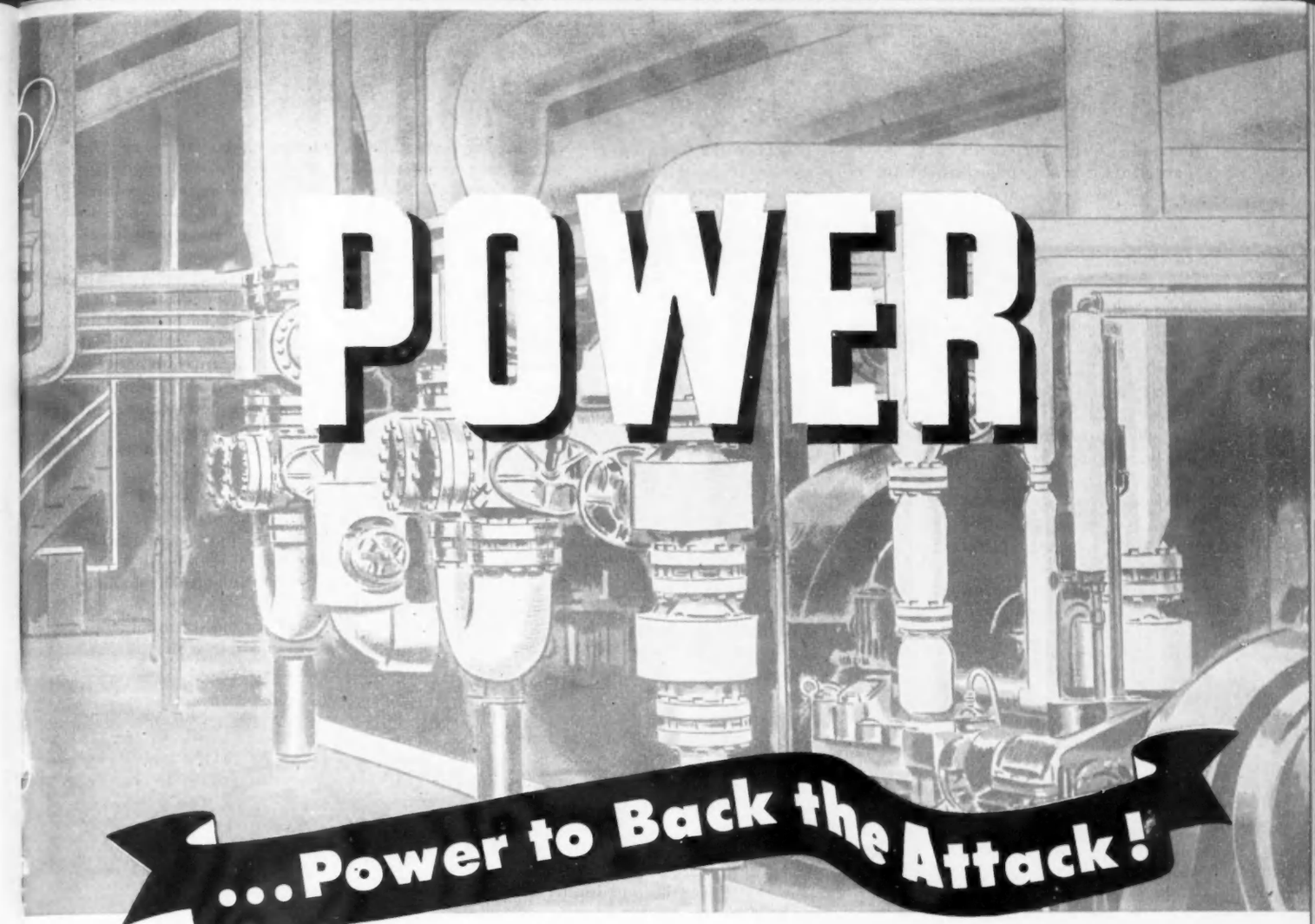

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dicated.) Consequently it may be regarded as a fair comparison of the effects of different spacings.

The resulting figures may be rather startling to those who have become accustomed to thinking that wider spacing invariably means a great saving, with consequently reduced unit costs and increased profits. For the conditions stated it is evident that, from the strictly cold-blooded standpoint of costs per net barrel of oil recovered and profits per dollar expended, the 10-acre spacing has the advantage over either the 20- or 40-acre spacings; and it is only when the density of a well to 5 acres is reached that the additional oil recovered involves the penalties of higher unit costs decreased profits per dollar of costs.

It should be emphasized that the barrel of oil in lease storage awaiting acceptance by the pipe line is the oil producers' finished product. Every item of cost incident to putting it there must be considered to obtain a fair comparison of the economic effect of different well spacings. The omission or misapplication of any of those figures can only result in distorted results.

Its prorata share of the total of those costs represents the operators' investment in that barrel of oil; and it is the profit per dollar of that investment which is significant rather than the apparent profit from lease operations only expressed in terms of an "investment" figure covering lease investment only and computed on a flat well-cost basis.

Summarizing, the evidence presented makes certain conclusions inescapable:

1. That well spacing does affect the recovery of oil from a reservoir; that increased well density results in increased recovery; and that within practical limits there is a definite mathematical relationship between the well spacing and the recovery.

2. That arbitrary wide spacing regulations impose definite handicaps on the adequate exploitation of small accumulations on sharp folds or against faults, and tend to increase the ratio of dry holes to producers in all cases.

3. That even from the standpoint of cost per barrel of oil recovered and of profit per dollar expended, it is not invariably true that the wider of two spacings is the more economical. For a given set of conditions there is a certain spacing which is the most economical one, and either a closer or a wider spacing will involve higher unit costs and lower unit profits.

While nothing herein is to be construed as an argument against the adoption of improved production practices in the attempt to obtain greater recoveries at lower costs, it would appear that a simple and highly effective method is being neglected when the possibilities of close spacing are ignored.

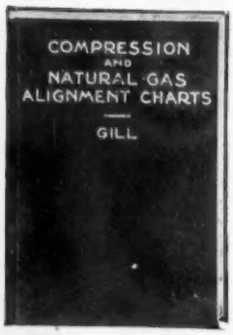
Since more wells mean increased recovery, there is a strong incentive to work toward lower development costs by utilizing every expedient to reduce the cost of the individual well rather than by widening the spacing.

Where wide spacing is temporarily adopted either because of material shortages or lack of information regarding the reservoir, it is highly desirable that a pattern be selected which will permit increasing the density by drilling intervening wells later.

With the existing urgency for an augmented oil supply, it would seem logical to resort to the drilling of additional wells in fields now having wide spacing which are favorable to closer spacing, especially since such drilling would add potential production, and reserves, with an absolute minimum of equipment as contrasted with the material requirements for exploiting new fields.

And finally, since optimum well density varies with crude-oil prices, it would appear to be in the public interest for crude-oil prices to be increased to levels which would encourage relatively close well spacing so long as the present downward trend of discoveries in relation to production continues.

COMPRESSION
AND
NATURAL GAS
ALIGNMENT CHARTS
By **THOMAS T. GILL**



The charts in this book have been found useful in solving field problems arising in connection with the measurement, compression and transmission of natural gas, and in the manufacture of natural or casinghead gas. As many of the formulas in common use in natural gas operations are of an impirical nature, with constants that must be evaluated under varying conditions, it will be found that alignment charts are sufficiently accurate for nearly all purposes except for metering large quantities of gas, and here they serve as an excellent check on other calculations. Contains 41 charts, 65 problems. Price $3.50 Postpaid.

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CONTINENTAL

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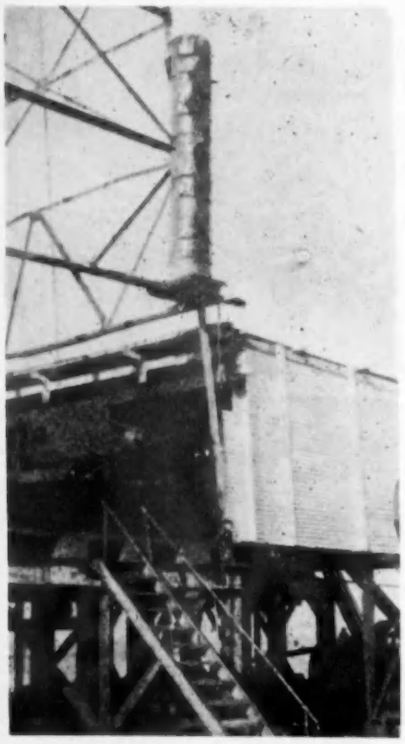
PRACTICAL OPERATING *Hints* FOR THE DRILLING RIG

$5.00 will be paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, *Houston*

In this and the succeeding two numbers, *The Oil Weekly* will review operating hints which have been carried in this section during the past four years. Selection of the hints to be republished has been made on a basis of their especial application to wartime conditions, their coverage of operating problems which are most apt to confront the man new at his job, and their value to widely separated areas. The 50 hints cannot hope to solve all problems, but are offered that they may serve to speed operations and thus to contribute to increased oil discovery and production.

1. WATER SUPPLY

High Tank Provides Floor Gravity Flow



Girt-mounted, this oil-drum tank is filled with pump supply, and serves when pressure unit is down.

SUPPLEMENTING the normal water supply storage tanks used in drilling operations, one company makes it a practice to install an emergency 200-gallon tank in the rig when on locations at which there is no high pressure water line connected.

Made of four 50-gallon drums welded in series end to end, the tall tank can be lifted easily with the sand line and set on a small platform clamped to the outside of an out-of-the-way corner of the rig just above the first girt.

Water from this tank is used principally for the hydraulic brake on the drawworks at times when the well is being drilled in with oil, when usually there is no water immediately available. It is used also for cleaning the floor, rotary table, drill pipe, and other miscellaneous or emergency uses when it would be necessary otherwise to go out and start the small water pump for each small need.

The tank is 10 feet or more above the derrick floor, and thus provides more pressure than could otherwise easily be obtained by gravity setting on a high-floor rig.

2. ROOFING

Portable Sections Protect Pump Units

RESULTING in a definite saving in time and material, one operator finds it convenient to shelter his pumps, power controlled machinery and certain mud-control apparatus with galvanized corrugated iron roofs made up in approximately 3x15-foot sections.

A ¾-inch eye-bolt with the loop exposed on the top side is secured in the exact center of each section so that it can be easily lifted with the aid of the light crane or truck-winch-operated loading pole usually used in setting up or moving equipment.

Each section has a letter and number painted on each end to correspond to a certain position in the set-up. The numbering system assures exact lining up of holes and fittings in a minimum length of time.

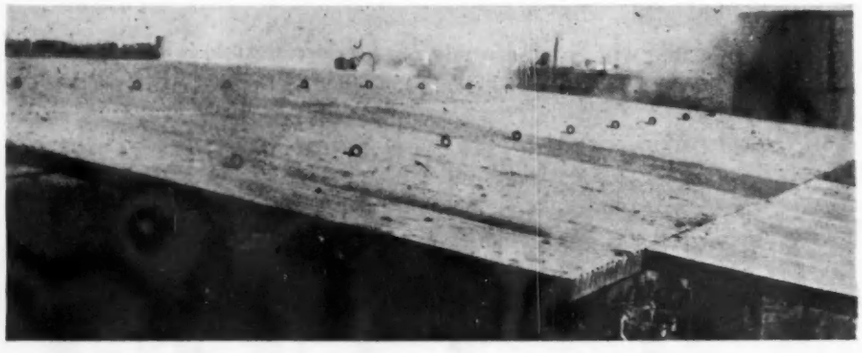
Since the corrugated iron is nailed but once on the wooden frame work of each unit, its life is considerably longer than the average of such material nailed up or torn down and transported in stacks of the individual sheets.

3. MUD HANDLING

Swivel Cranes Serve Pump Suction Lines

CHAIN hoists mounted on cranes directly attached to pump skids are used by one Gulf Coast operator to simplify regulation of the mud suction pipes, and to constitute a time-saving element in rigging up. As the cranes are connected with the pump skids, when it is necessary to move pumps, the suctions are drawn up by means of the chain hoists and the entire assembly transported as a single unit to the new location, set in place, and the suctions lowered.

Each crane standard is set loosely inside a two-foot piece of 6-inch pipe welded at a convenient place on the skid. The crane is constructed of a single piece of 4-inch drill pipe, standing upright in the socket and bent at a 90° angle near its center to allow the upper half to extend horizontally over the mud pit above the suction pipe. Welded bracing, of 3-inch pipe, is



Erected in standardized sections, with lifting eye positioned in each panel, this type roof may be shifted quickly, and provides cover with a minimum expenditure of labor at the site.

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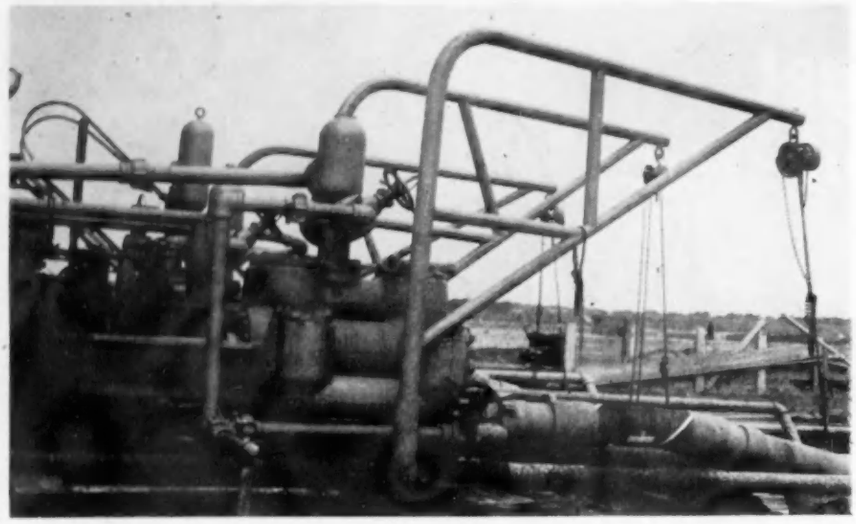

Set in sockets close to the pump base, these reinforced cranes support hoist at pivotal point of mud line, and may be unshipped and utilized for handling materials during pump repair or rigging-up.

placed inside the 90° arc to afford maximum support.

The end of the crane is equipped with an eye bolted through the pipe, and to it is fastened a hoist bearing a chain of sufficient length to permit its attachment to the hook on top of the suction pipe directly below.

A secondary use of the apparatus is provided by the swivel action of the cranes which permits their free rotation in the 6-inch sockets. By unfastening the attachment to the suction line, the cranes are swung or pivoted around and the hoists used in lifting heavy equipment over the relatively wide area encompassed.

4. BLOW-OUT PROTECTION

Readied Packer Meets Emergency Demand

A PACKER made up and ready to be dropped at a moment's notice into place to seal off the drill stem, is kept on one rig floor in a spot where it is out of the way, free from possible damage through normal rig operations, yet instantly available.

The packer is suspended from two ½-inch bolts screwed into holes in the top ring, bits of soft rope serving to hang the assembly from a light line, slung high in the derrick.

The entire set-up is placed over a short stub of two-inch pipe fastened at the edge of the derrick floor, and the supporting line so adjusted that the packer swings some 18 inches off the floor.

To use, the two-inch pipe is pulled from its socket and the packer, still suspended on its line, swings across the floor and drops into place through the untying or cutting of the bits of soft rope yarn.

The packer is readily inspected for quick application as it hangs on its swing line, and the condition of the packing elements may be checked for resilience in advance of being subjected to the sudden load of an impending loss of well control or possible blow-out.

Slung on line from high in rig, this unit is ready to clamp on drill pipe and lock in bushing.

5. DRILL STEM CARE

Casing Kelly Shell Protects Drive Faces

PROPER care and protection from kinking or bending of the kelly joint can not be over-emphasized, particularly for sizes below 5-inch.

One company using a 4-inch kelly joint takes an extra precaution by never rolling it out on the drilling pipe storage rack before first inserting it in a string of short joints of 6¼-inch light casing. The casing protects the corners of the joint from nicks or bending, and makes it easier and more quickly handled.

Two or three casing joints, each 10 or 15 feet long, are used instead of a single long one, as one or two men can block up one end to slip on the shorter joint.

Short casing sections enclose kelly square and absorb impact during handling of unit to and from truck.

6. LUBRICATION

Handy Lift Device Stores Oil Drums

DRUMS of lubricating oil, cleaning solvent and gasoline are quickly handled by a company that found it advantageous to maintain a low, solidly built, wooden rack which would accommodate the several types of drum supplies used on a deep drilling project.

At the end of the drum rack, a standard was erected to support a horizontal 2-inch pipe and crank handle, built high enough to allow a drum to pass easily between it and the rack bed. A 16-foot length of rope, with the two ends nailed

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FULL HOLE

SIZE	Tool Joint Dia. O.D.	Tool Joint Dia. I.D.	Tool Joint Length Approx.	Diameter of Upset Drill Pipe: Diameter of Land	Diameter of Upset Drill Pipe: Inside Diameter
*2⅜"	4"	1⅞"	17"	3"	1¼"
3½"	4⅝"	2⅛"	18"	3⅝"	2⅛"
4"	5¼"	2¼"	20"	4⅛"	2¼"
4½"	5¾"	13"	20"	4⅝"	3⅛"
5⅛"	7"	**3¼"	22"	5¼"	4"
6⅝"	8"	5"	24"	6¾"	5"

Note: Acme Full Hole can be Furnished in Sizes: 3½"-4½" and 5⅛".
* Reed Full Hole, Not A.P.I. Standard. † 2¼" or 3⅛" Optional.
** 4" Optional. ‡ 1⅞" Optional.

SEMI-INTERNAL FLUSH

SIZE	Tool Joint Dia. O.D.	Tool Joint Dia. I.D.	Tool Joint Length Approx.	Diameter of Upset Drill Pipe: Diameter of Land	Diameter of Upset Drill Pipe: Inside Diameter
3½"	4⅜"	2⅛" †	18"	3⅝"	2¼"
4½"	6"	3⅛" †	20"	4⅝"	3⅛" †

Note: The Tool Joint Box and Pin Connections have 4 A.P.I. Threads per Inch, with Larger Pin Diameter than A.P.I. Full Hole.

REED *Super Shrink-Grip* TOOL JOINTS FOR INTERNAL FLUSH DRILL PIPE

SIZE	Tool Joint Dia. O.D.	Tool Joint Dia. I.D.	Tool Joint Length Approx.	Diameter of Upset Drill Pipe
2⅜"	4⅛"	2⅛"	17"	3⅛"
3½"	4⅝"	2¼"	18"	3⅞"
4"	5¾"	13"	20"	4⅝"
4½"	6⅛"	3⅛"	20"	5⅛"
5⅛"	7⅜"	4⅛"	22"	6⅛"
6⅝"	8⅝"	5¼"	24"	7⅛"

† 2¼" or 3⅛" Optional.

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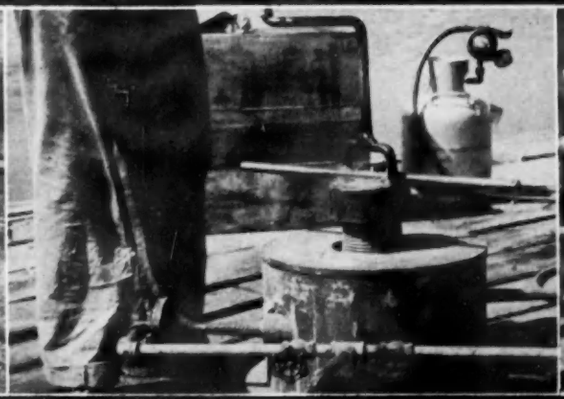

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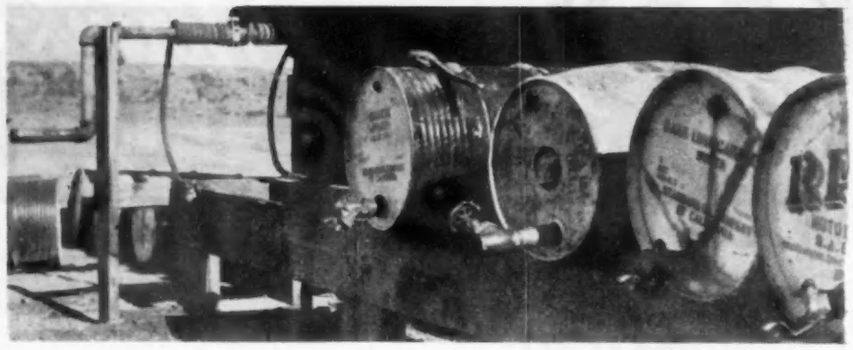


Rope sling, fastened to drum rack and center of windlass drum, lifts oil drum and automatically places it on the line as the crank is turned and the twin bights of rope are shortened.

to the end of the rack and its exact center clamped to the horizontal pipe, was wound in windlass fashion.

One man can unload the full drums on the rack by uncoiling sufficient rope to allow the double loop to extend flat on the ground, and out far enough so that the drum can be rolled into it. After the drum is centered, it can be quickly lifted up and rolled out on the rack with the crank windlass.

7. PIPE HANDLING

Unitized Pipe Rack Simplifies Layout

STEEL pipe racks are used by Harry L. Edwards Drilling Company rather than racks of wood sills that must be rebuilt at each location.

The base of each leg supporting the rack is a 2-foot section of 4½-inch scrapped drill pipe, with legs of the same material welded to a 30-foot section of drill pipe for the top supports. Sections of 2½-inch line pipe are used for braces between the legs, and three 4-inch sleeves are welded to each section of the rack.

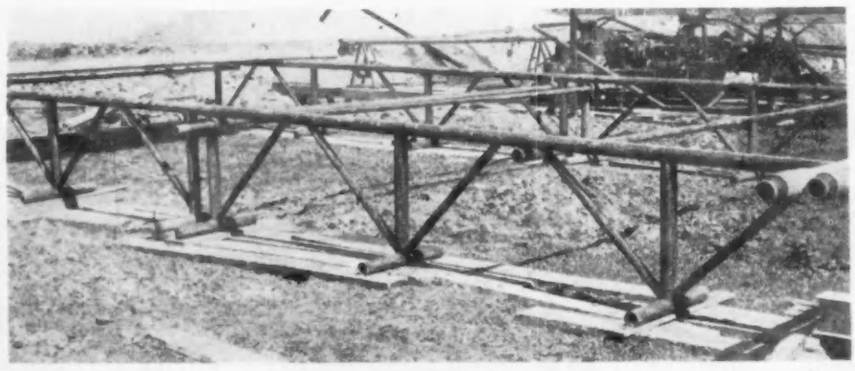
When building, joints of 2½-inch line pipe are fitted and bolted into the sleeves to form cross braces. The resulting rack supports much weight and is readily portable.

8. FIRE PROTECTION

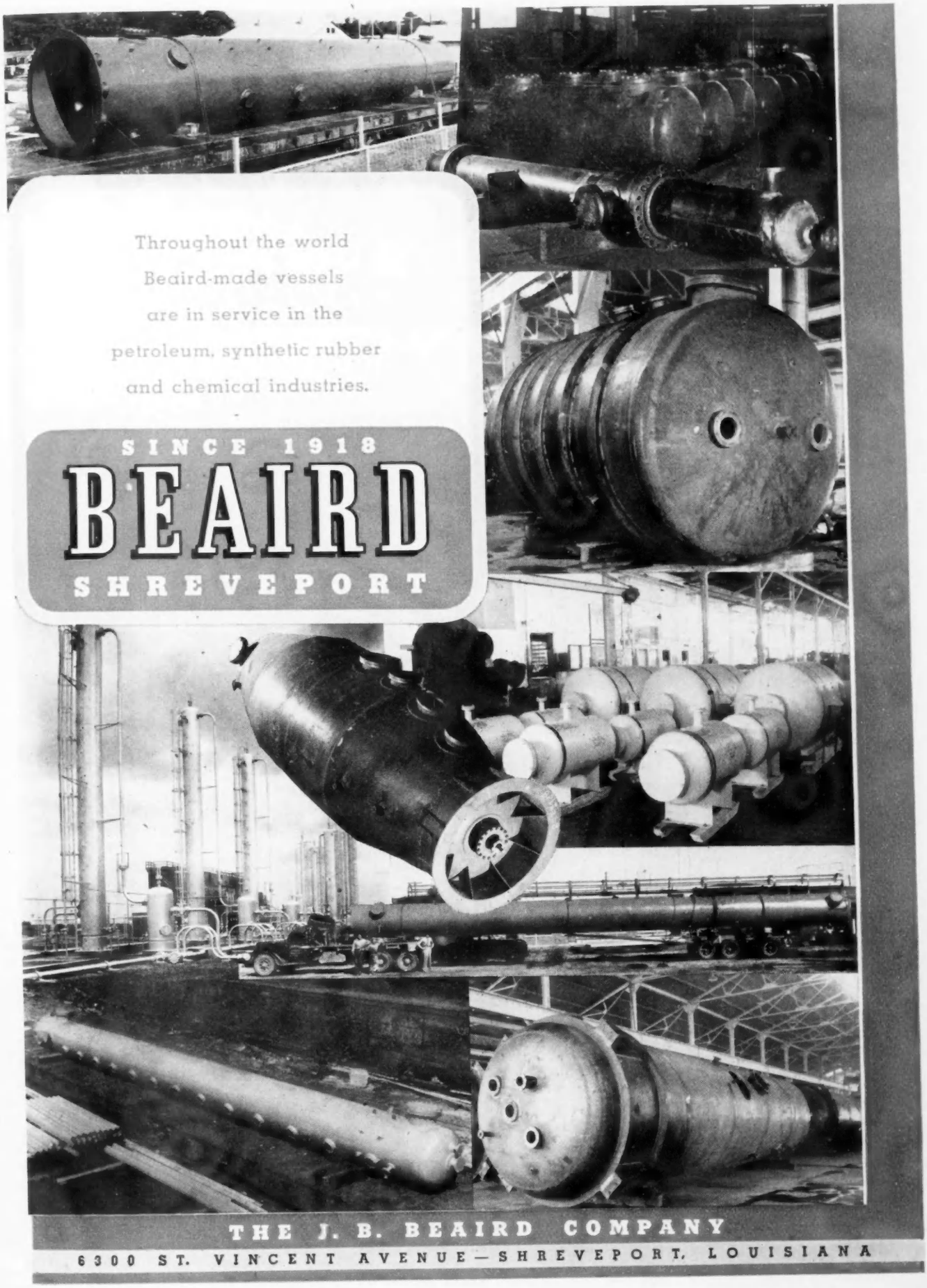
Interchangeable Unit Equips Lease Truck

Box bed, filled with fire fighting equipment, may be dropped onto flat bed unit and instantly moved.

TO ATTAIN greater speed in fire control, one California company has developed a system of portable fire-fighting units located strategically in the field. The unit consists of a wooden box proportioned to fit flat bed trucks. This box is sturdily constructed and



Made up by welding together scrap drill stem and equally unserviceable line pipe and casing, this steel rack simplifies rigging-up, and provides ample support for full stand of pipe.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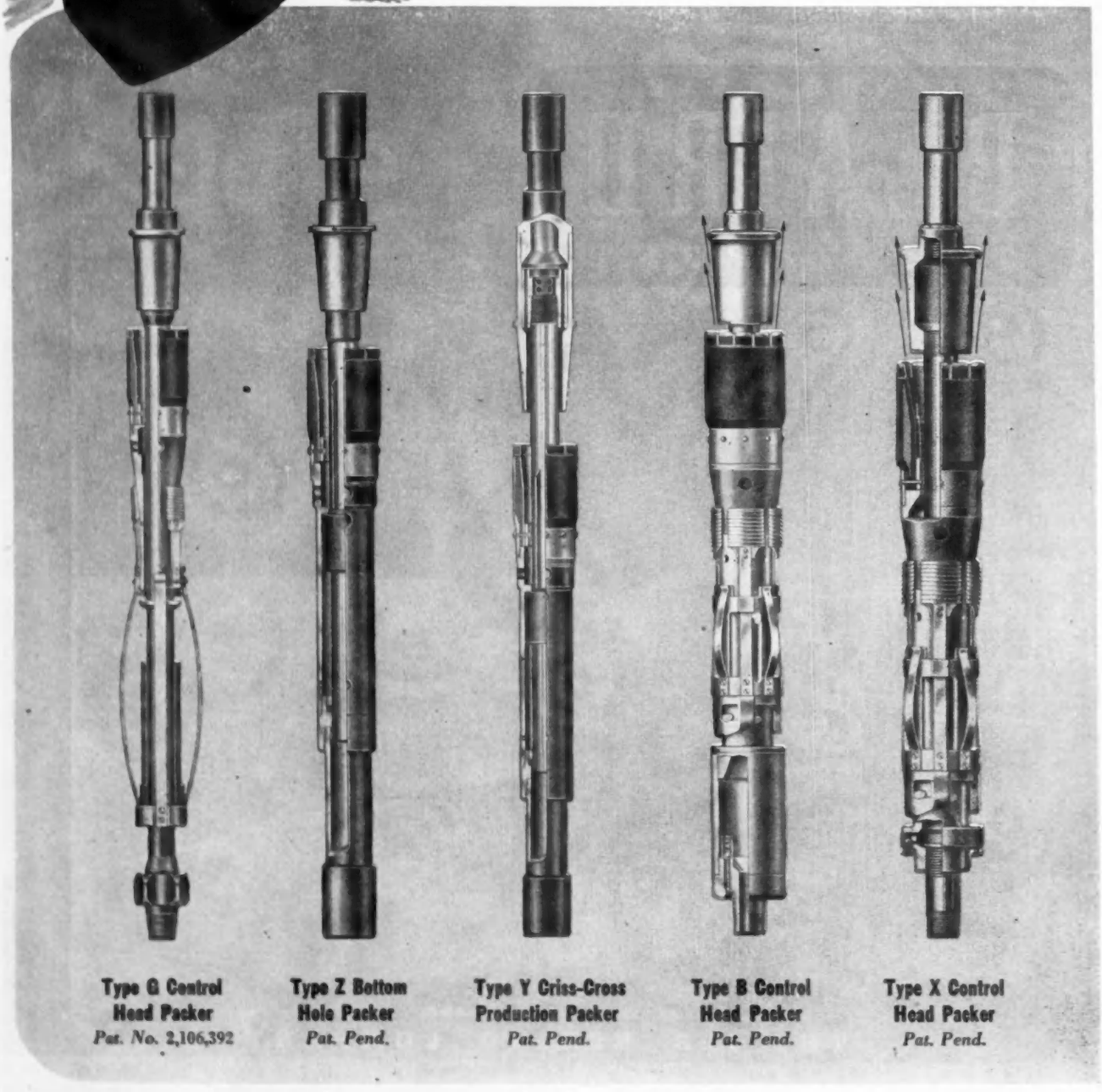

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Type Z Bottom Hole Packer
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Pat. Pend.

Type X Control Head Packer
Pat. Pend.

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IF you have ever tried to run a packer in heavy fluids or under other extremely difficult conditions, you know that *no single packer* can be used efficiently and economically on every packer job today. The conditions encountered in wells in one field may differ entirely from the conditions faced in another—and your type of packer may have to differ with them.

For the *right* performance, it takes a packer that's *built to fit the job!* That's why the American Iron & Machine Works Co. now offers *5 great packers* . . . each designed and engineered to meet a specific need.

But remember this—even though these packers differ in design, each packer has our famous *horizontal expanding, non-sticking packing elements.* And each packer has been designed and built by the same skilled engineers and craftsmen who have won for American Iron and Machine Works Co. packers such a great reputation for economical and efficient operation. For the *right* packer to *fit your job*, see your nearest American Iron & Machine Works Co. salesman or your supply store.

CHOOSE THE PACKER THAT *fits the job!*

TYPE G CONTROL HEAD PACKER—Our engineers designed this packer for use in areas where heavy fluids and other extremely difficult packer conditions are encountered. See how it is designed with *no J-tool* which simplifies setting under all conditions. Our Type G Packer has been used extensively by major oil companies for over a year and its popularity is growing by leaps and bounds.

TYPE Z BOTTOM HOLE PACKER—Due to its extreme simplicity, this has become one of the most popular bottom hole, anchor-type packers in use today. It has *no slips, no springs, no gadgets* of any kind to foul or interfere with its efficient setting. Note *forking bar* on tube which permits the efficient use of *safety joint* above packer.

TYPE Y CRISS-CROSS PRODUCTION PACKER—To be used in dual completion installations in conjunction with Type Z Bottom Hole Packer to divert lower high pressure pay into the annulus and the upper low pressure pay into the tubing. There are a lot of engineering features you'll like about this packer. For instance, it is designed with a disk at the top of the packer that can be broken through, in case of emergency, to allow entry through the packer. What's more it has *full tubing size opening* through-out the length of the packer. Has same locking bar on tube as Type Z Packer.

TYPE B CONTROL HEAD PACKER—This packer rates high when it comes to extending the flowing life of weak wells that ordinarily would have to be pumped. The Type B surge or flow chamber can be furnished on our Type X Body as illustrated, or on our Type G No-J body.

TYPE X CONTROL HEAD PACKER—You can effectively meet *all* control head packer requirements with this Type X Packer. Can be used to prolong the natural flowing life of wells . . . for flowing weak wells . . . in conjunction with gas lift equipment . . . for washing formation casing perforations . . . for making water shut-off test of the casing shoe . . . for locating leaks . . . or in repressuring or acidizing.

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contains all of the necessary fire fighting equipment such as shovels, picks, hoses and chemical fire fighting apparatus.

When not in use, the box is kept under a sheet iron roof which is supported by four pipe legs. The box is slung by four quickly detachable iron hooks and at such a height as to clear all makes of truck bodies. All that is necessary when an emergency arises is to back the nearest available truck under the box, unhook the supports, lash the box to the truck and drive directly to the fire.

Under this system, two men can easily convert an ordinary flat bed truck into a fire-fighting unit and many valuable minutes can be saved which otherwise would be lost waiting for a crew and especially constructed fire truck.

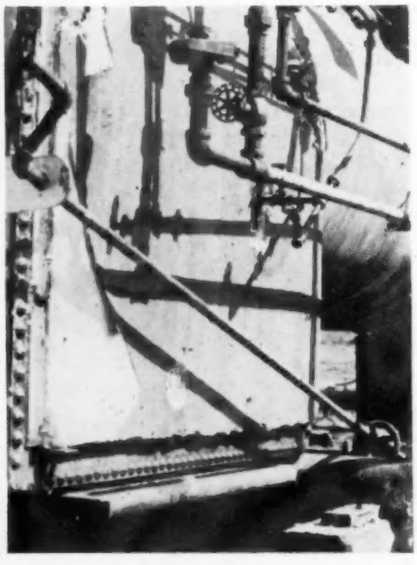
9. BOILER OPERATION

Remote Control Aids Blow-Down Handling

POTENTIAL dangers that exist when a boiler is being blown down create a safety problem that may be solved by making it possible for each boiler to be blown down from the front. During the operation, the fireman is able to watch the fall of the water in the gauge glass.

A 2-inch needle type valve is installed a short distance from the downstream side of the regular valve, and extending slightly beyond the outside of the fire-box wall and located so that the stem of the handle points toward the front of the boiler. A ¾-inch pipe is passed through a hole in a short piece of flat steel plate bolted at arm level to the front of the boiler, and is then extended downward to the valve. A universal joint of the automotive variety connects the pipe end to a simple steel bracket clamped to the valve handle. Two ¾-inch ells and two 6-inch nipples provide a convenient handle for quickly opening and closing the valve.

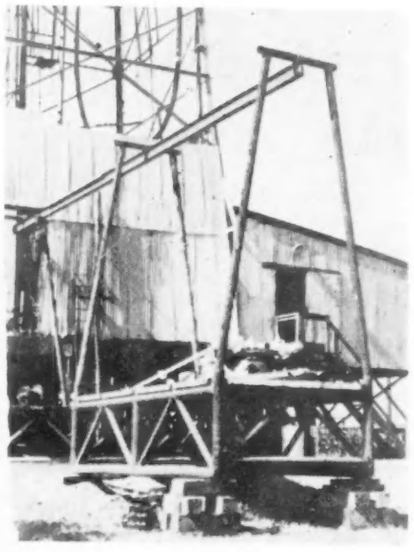
Normal operation in using the extension handle consists of first opening the regular blow-off valve, then, from the front of the boiler, quickly spinning open the other valve. When the gauge glass indicates that the water level is falling to a dangerously low point, the valve can be closed immediately, after which the regular blow-off valve can be closed.



Second valve, controlled by crank at boiler head, enables fireman to watch water as he clears mud ring.

10. RIG SUPPLIES

Track and Trolley Handle Equipment



Monorail and trolley aid transfer of heavy units between truck bed and working level of derrick.

FOR handling heavy bits and other drilling tools, one company has built a combination chain hoist track support and storage wharf to be used in conjunction with unitized heavy drilling tools.

The wharf end of the unit has a wood floor and two track supports, open on all four sides, but set at a height so that supplies can easily be moved from truck bed to the platform. The rig end of the unit has a small platform to receive bits and small tools directly from the truck when driven next to the derrick. The trolley runs the full length of the unit, and is a means of speeding up operations as bits and other equipment can be moved from the rotary table to the truck with a minimum of effort.

☆ ☆ ☆ ☆ WASHINGTON ROUNDUP ☆ ☆ ☆ ☆

TEMPORARILY submerged pending action on the Brewster-Moore resolution for investigation of Petroleum Reserves Corporation's Middle East pipeline project, the fight over the foreign oil situation abated last week except for a little verbal sniping, but attention centered on other problems which are vexing the industry.

Specifically, the most important of these were crude price, rubber and manpower.

In the field of price, OPA, after weeks of hesitation, laid its "incentive program" before representatives of the independent producers who found that it consisted solely of a 35-cent compensatory payment for stripper-well production, with no provision for either secondary recovery operations or new wells.

In another sector, the slowness with which the oil industry's butadiene plants are being completed was reported a cause of concern, with possibilities that another over-all study of the rubber program might be made. The situation, serious enough under any circumstances, is made more critical by the increased military demand and the steadily spreading need for civilian tires.

The manpower situation, too, is becoming tighter as a result of new policies of selective service which are seen as taking practically every man between 18 and 22 in the industry. The suggestion has been made that the oil, chemical and other industries most severely affected should get together and present a joint appeal to the War and Navy departments for relief.

Duplicate Activities of PAW Rapped by State Officials

»

Independent Interests Displeased With OPA Price Move

»

Congressman Thinks Arabian Line Agreement Needs Change

»

Butadiene Plant Construction Delay Worries Capital

»

By B. F. LINZ,
Washington Correspondent

☆ ☆ ☆ ☆

OPA Production "Incentives" Said to Give 35-Cent Increase for Strippers

Independent oil interests last week were given a preview of incentives worked up by the Office of Price Administration for submission to Stabilization Director Fred M. Vinson as a substitute for the general crude oil increase which both OPA and Vinson have rejected.

Under the spur of impending Senate hearings on the Disney bill to raise crude ceilings and the pointed questions by the Independent Petroleum Association whether the OPA was working out any suggestions or was leaving the whole matter to the oil industry, the price agency has listed as "incentives" some recommendations it made repeatedly in the past for the payment of subsidies.

Reportedly, OPA's program called for a 35-cent increase in the price for stripper well, that amount to be paid by the government, probably through Defense Supplies Corporation, as the excess cost of transportation by rail now is compensated.

New feature would be the reimbursement of refiners for the excess cost of the oil, rather than producers, a move which would save paper work and delay, it being pointed out that there are only about 400 refiners, who take the oil of some 20,000 producers eligible for the relief.

The big question is whether anything is to be done for the wildcatter. Industry representatives have long contended that a higher price for new oil is necessary if PAW's drilling program is to be attained; OPA cites company earnings and argues that producers are doing all right, particularly with the help of the depletion allowance. Furthermore, OPA claims, manpower and materials are more likely to hobble exploration than price.

With OPA's program limited solely to stripper-well production, the independent interests were quick to voice their dissatisfaction and renew demands for answers to specific questions recently propounded by the Independent Petroleum Association (THE OIL WEEKLY, February 21).

The conversation was just conversation and no more, with OPA indicating no intention of retreating further at this time from its position that there must be no over-all increase for crude.

IPAA now is compiling all suggestions which have come in from its own members and other sources and has called a meeting of its board of directors, to be held in St. Louis, March 9, for the purpose of studying them and attempting to work out a program of its own. Any program which will receive the support of the independent producers must cover new production and secondary-recovery as well as stripper wells —and preferably should cover all production, regardless of source, as contemplated in the various appeals which have been made over the period of the past two years or more.

Meanwhile, efforts are being continued to secure a quick hearing by the Senate banking and currency committee on the Disney bill to raise crude ceilings, but so far no date has been set.

Spain to Get No Oil Shipments During March

Washington last week made it clear to Spanish Generalissimo Franco that it will stand firm behind its demand that he cease cooperating with the Nazi government, letting it be known that the suspension of oil shipments to Spain would be continued through March and would be accompanied by other sanctions if increased pressure becomes necessary.

So far, it was said, Franco has acquiesced only in part to the several steps which the United States and British governments told him must be taken if Spain is to be considered and treated as a neutral country.

Draft Rules Tightened For Young Registrants

New policies adopted by selective service as a result of recent amendment of the selective service act by Congress, under which, effective February 1, registrants between 18 and 22, whether fathers or not, are not to be deferred by reason of occupation except where rare and exceptional circumstances prevail, are seen in Washington as creating a critical situation with respect to oil-industry research, technical service and geophysical operations.

Officials, however, see little chance of the industry retaining any great number of such workers.

Deferments for such registrants are to be applied for on Form 42-A (Special), which requires the approval of the state selective service director before the local board can grant the application.

Under certain circumstances the PAW labor counseler and the appropriate operating divisions of PAW will be able to assist companies in securing deferments, but it was explained that in such cases it probably will be necessary for PAW to request the Bureau of Manpower Utilization of the War Manpower Commission to make a survey of the plant involved with a view to certifying to the state director that registrants for whom it is desired to file applications are employed in a critical occupation and are utilizing their skills to the fullest extent, and it will also be

necessary for PAW to determine whether continued deferment of the registrants is absolutely indispensable if the company is to meet its wartime commitments; it will also be necessary to show immediate danger of serious disruption of an approved production program.

These requirements apply to registrants engaged in critical occupations such as chemical engineering and geophysics, as well as to those engaged in essential occupations, and under no other circumstances can support be given to requests for continued deferment of registrants in this age group.

The rigorous provisions of the amendments indicate that no registrant between 18 and 22 will be deferred unless employed in a critical occupation, and that it will be much more difficult to procure deferment for single and childless married men under 30 than has heretofore been the case, and employers in the petroleum industry were advised to review their present personnel with a view to taking necessary measures to meet heavy withdrawals.

Federal Gasoline Tax For January Drops Off

Federal gasoline tax collections in January hit the lowest level in 12 months, dropping from $17,068,957 from $24,575,025 in December, it was announced by the Internal Revenue Bureau. The figure was $7,800,000 under the $24,884,420 for the first month of 1943, and brought the total for the first 7 months of the current fiscal year to $162,692,599, or $31,298,000 under the $193,990,616 received in the corresponding period a year ago.

Revenues from lubricating oil and pipe-line transportation also were at a low level, January collections of the former dropping to $3,370,483 from $3,697,398 in December and $4,156,532 in January, 1943, and the latter to $1,094,154 from $1,561,819 in December and $1,242,178 a year ago.

For the 7-month period, lubricating-oil collections aggregated $28,928,450, an increase of $5,100,000 over the $23,821,951 recorded last year, and pipe-line transportation paid $8,903,116, an increase of $444,000 over last year's $8,459,048.

Excess Hauling Costs for West Texas Crude Listed

Defense Supplies Corporation last week announced conditions under which it will pay the excess cost of hauling oil by rail from West Texas to District 2 refining points, compensation to be payable on shipments under schedules approved by PAW on which movement commenced on or after December 4, last, to refiners in District 2. Claims are to be filed with Price, Waterhouse & Company, Chicago, monthly, accompanied by bills of lading, receipted freight bill and a copy of the PAW shipping schedule or other approval.

The schedule of payment is based on shipments originating at Levelland, Midland and McCamey, Texas, and is based in part on tank car tariff rates in effect last December 4. The compensation, per barrel, ranges from 49.66 cents to $1.483.

Voorhis Says U. S. Buying International Liability With Its Pipe-Line Money

The government's commitment to build the Saudi Arabian pipe line and to buy 1,000,000,000 barrels of crude at 25 percent under the lesser of the posted price for the oil or the price of United States crude will net the companies owning the field a profit of $350,000,000, it was charged February 21 by Representative Voorhis of California.

In an address to the House, Voorhis estimated that cost of producing the oil would be around 20 cents per barrel, with an equal amount payable in royalty, but he predicted, the companies will post a price not substantially lower than the price in the United States, or not less than $1 per barrel.

The 25 percent cut in price to the government, he asserted, will be of little benefit because of the transportation cost of 80 cents per barrel for delivery on our East Coast, making an over-all cost considerably higher than for domestic oil.

If the government goes into the business at all, it must go much deeper, Voorhis contended. "What the United States is buying with its pipe-line money under the present agreement is a terrific international liability with no compensating advantages whatsoever," he said.

Cartel Indorsement

"I know that without government control in the public interest of policies where they affect international relations and the economic well-being of the people of the area and, indeed, in the whole Eastern Hemisphere or where they affect the price of this oil, this oil is going to be sold under control of a cartel which inevitably will be arranged by the American major companies and the British. And it will be a cartel endorsed in effect by the United States government through its action in this pipe-line agreement. Although the United States government will be virtually a partner to the cartel, we will be without the slightest degree of effective control over what the cartel itself may in the future do."

Voorhis predicted that such a cartel would mean high prices for Persian Gulf oil, which would prevent it from becoming available generally to the people of the Eastern Hemisphere and make it advantageous to ship Western Hemisphere oil to the East, thus further depleting our own resources.

"There are altogether six major oil companies which stand to benefit tremendously from the construction of this pipe line by the government," he told the House. "They are the Standard Oil Company of California, The Texas Company, the Gulf Oil Corporation, Socony-Vacuum, Shell, and Standard Oil of New Jersey.

"The first three of these companies are those who signed the agreement with Mr. Ickes. Socony-Vacuum, Shell and Standard of New Jersey own between them one half of the entire Qater Field, which is on a small peninsula just to the south of the Standard-Texas interests. Negotiations are now in progress which unquestionably will result in having this pipe line serve the Qater Field, and these other three major companies."

Urges Different Arrangement

All six companies, he charged, are heavily represented in the several administration agencies concerned with oil, the Army-Navy Petroleum Board executive officer, Commodore Andrew Carter, having been connected with Shell, while General Pyron, associated with him, is from Gulf. Other officials named by Voorhis included Deputy Administrator Davies, of Standard Oil Company of California; James T. Duce, former head of the PAW foreign oil division, of California-Arabia; Max Thornberg, former petroleum adviser to the State Department, of Bahrein Petroleum Company; Charles Rayner, present adviser, formerly with Socony-Vacuum Oil Company; Dr. E. DeGolyer, formerly with Standard Oil Company of California, The Texas Company and Gulf Oil Corporation.

"This pipe line can and no doubt should be built, but it should be built under different circumstances from those proposed in this agreement," Voorhis said.

Big-Inch Schedule Above Line's Regular Capacity

The schedule for operation of the big-inch line calls for 5000 barrels a day above its 300,000 barrel-capacity for the coming three months, the set schedule for March calling for 9,455,000 barrels and the tentative assignments for April and May calling for 9,150,000 and 9,455,000 barrels, respectively.

The daily schedule for the 3 months calls for 143,000 barrels of East Texas crude, 56,700 barrels from Southwest Texas and 105,300 barrels from West Texas. The daily purchases by War Emergency Pipelines, at Longview will be as follows:

East Texas: Atlantic Refining Company, 21,500 barrels; Central Pipe Line Company, 1000 barrels; Cities Service Oil Company, 6600 barrels; Humble Oil & Refining Company, 24,500 barrels; Magnolia Petroleum Company, 5700 barrels; Pure Oil Company, 8000 barrels; Shell Oil Company, 19,200 barrels; Sinclair Prairie Oil Marketing Company, 5000 barrels; Sun Oil Company, 34,900 barrels; Tide Water Associated Oil Company, 16,600 barrels.

Southwest Texas: Globe Oil & Refining Company, 9,200 barrels; Gulf Refining Company, 7,000 barrels; Houston Oil Company, 1400 barrels; Humble Oil & Refining Company, 18,900 barrels; Magnolia Petroleum Company, 9000 barrels; Sun Oil Company, 10,700 barrels.

West Texas: Atlantic Refining Company, 43,000 barrels; Gulf Refining Company, 20,000 barrels; Humble Oil & Refining Company, 42,300 barrels.

Little-Big-Inch Schedule For Three Months Given

Initial operating schedules for the Little-Big-Inch pipe line call for the purchase at Baytown and Beaumont, Texas, of 2,600,000 barrels of No. 2 heating oil

during March and, tentatively, 2,850,000 barrels of heating oil and 600,000 barrels of kerosine in April and 2,945,000 barrels of heating oil and 620,000 barrels of kerosine in May.

Sales at Staten Island, New York, and New Jersey terminals are scheduled as 4,650,000 barrels of heating oil in March, 3,000,000 barrels in April and 2,945,000 barrels of heating oil and 620,000 barrels of kerosine in May.

The balance of space available in the system is being reserved for the transportation of products required by the government. Total capacity of the line is estimated at 150,000 barrels daily for March and 180,000 barrels daily for April and May, the latter being 55,000 barrels less than originally contemplated capacity.

Products Line Filling Slowed by Mountains

Filling of the little-big-inch pipe line has been slowed down because of air binding east of Norris City, efforts to eliminate which have been only partly effective, it was disclosed February 24 in the weekly PAW pipe line report.

During the first month of filling operations more than 2,220,000 barrels of gasoline and fuel oil were put into the line, and the head of the stream now is near Wind Ridge, Pennsylvania. Although it is feared that air binding will be experienced in the mountainous section of Eastern Pennsylvania, every effort is being made to have the leading gasoline slub reach Linden, New Jersey, by March.

It is not believed the even-numbered stations on the line can be made ready for service for another week, delaying two-unit operation over the system and the full three-unit operation which is expected to follow soon.

Due to the perfection of arrangements for the hauling of oil by rail, it is understood Sohio Corporation's 43-mile 8-inch crude line from Anding to Mayersville, Mississippi, will not be constructed.

On the Stanolind Pipe Line Company's crude line from West Texas to Drumright, Oklahoma, pipe laying is about 70 percent complete, with 312 miles of pipe strung, 275 miles of ditch dug, 270 miles of pipe welded and 179 miles of ditch backfilled. The Pease, the Salt Fork of the Red, Wichita and South Canadian river crossings are completed, and that on the North Fork of Red River is about 40 percent completed. Feeder lines in the Slaughter and Wasson fields are completed, and sufficient equipment will be installed by the end of the month to run 40,000 barrels daily of crude to Drumright when pipe laying is completed. The first 40 miles of line north of Slaughter will be filled as soon as the initial station is ready to operate.

On the Magnolia Pipe Line Company line from Seminole to Corsicana, Texas, the 46 miles of 8-inch loops between Midland and Seminole are completed and in service, Andrews Station is complete except for installation of a portable pumping unit not yet received, and construction of the 335-mile 12-inch line from Midland to Corsicana is 93 percent complete. To February 24, 329 miles of pipe had been strung, 324 miles of ditch dug, 319 miles of pipe welded and 311 miles of the line completed.

Oil State Regulatory Officials Want PAW to Abandon Certain Activities

Abandonment by PAW of such activities as interfere with those of the regulatory bodies of the oil producing states was urged February 25 in resolutions adopted at the quarterly meeting of the Conference of Oil State Regulatory Officials.

Included in such activities, it was brought out in discussion of a resolution to be submitted to Administrator Ickes, are the regulation of spacing and drilling and production of oil and gas wells, which it was asserted not only duplicate the state activities but in many instances prove to be a hindrance to the latter.

"There is a growing fear on the part of many persons in the oil industry that an effort will be made to make permanent the PAW set-up," it was explained by Colonel Ernest O. Thompson of the Texas Railroad Commission, vice chairman of the Conference who presided at the meeting in the presence of Chairman Hiram Dowd of New Mexico. "This is contrary to the often expressed intention of those in charge. The operators with whom we have come in contact feel that unnecessary controls and regulations should be dropped and discontinued whenever brought to light."

To a considerable extent, the opposition to continued PAW operation in this field was based on the principle of state's rights, it being pointed out that the only proper sphere of the federal government is in the enforcement of the Connally hot oil act prohibiting the interstate shipment of oil produced in violation of state regulations, while the states have the exclusive right to specify the conditions under which oil may be produced.

The discussion brought out a belief that many operators refuse to comply with all the regulations of PAW and fail to drill wells which would be sunk if the federal regulations were not in force. The lifting of those regulations, it was asserted, would result in broader drilling of wildcats.

There was little criticism of PAW operations as a whole, it being agreed that it has done a fine job, Thompson said, "but on the other hand," he added, "it is now clearly apparent that some of the many ramifications may now be dropped, and efforts centered on functions that are still essential to the war effort.

"The splendid service of PAW in coordinating the industry's efforts for war can be made even better by elimination of the non-essential and unneeded controls and release men to the industry who are now bothering with such things as well spacing and rules making for drilling and producing oil and gas in states having adequate regulatory laws on the subjects.

"In short, we are asking that duplication of effort by state and federal authorities be avoided in states that have laws and administrative bodies doing the same work."

Wants Texas to Produce Excess Potential Figure

Failure of PAW to permit Texas to produce its excess potential of some 250,000 barrels a day, mostly in West Texas to fill the more than 124,000,000 barrels of steel storage tanks now lying idle, was criticised on February 25 by Colonel Ernest O. Thompson of the Texas Railroad Commission, in Washington for the meeting of the Oil State Regulatory Officials Conference.

Thompson declared that, even with all of the new transportation facilities which have been developed in the past three years, it is impossible to move all of the oil now being produced in the state, and approximately 100,000 barrels a day is going into steel storage. At the same time, he said, the state can produce another 250,000 barrels daily without over-production or waste and should be permitted to do so and fill its storage as insurance against a sudden need for more oil than could be brought out currently.

Today, with its production of 2,058,000 barrels of oil every 24 hours, the state of Texas alone is producing some 200,000 barrels more than the total amount of oil and products supplied by the United States for war purposes, which the commissioner placed at 800,000 barrels a day.

Bureau of Mines Report Gives Figures for 1943

United States crude oil production last year aggregated 1,503,176,000 barrels, a daily average of 4,118,000 barrels compared with 1,386,645,000 barrels, or 3,799,000 barrels daily in 1943, it was reported last week by the Bureau of Mines.

Natural gasoline and benzol production totaled 90,579,000 barrels against 85,719,000 barrels in the preceding year, making a total production of 1,593,755,000 barrels against 1,472,364,000 barrels and a daily average of 4,366,000 barrels against 4,034,000 barrels.

Despite this heavy output it was necessary to draw nearly 13,900,000 barrels out of storage, and stocks at the close of the year stood at 484,054,000 barrels compared with 497,940,000 barrels on December 31, 1942. Included in the year-end stocks were 241,762,000 barrels of gasoline-bearing crude, against 234,889,000 barrels in 1943; 8,289,000 barrels of heavy crude in California against 10,865,000 barrels; 4,541,000 barrels of natural gasoline against 4,632,000 barrels and 229,462,000 barrels of refined products against 247,554,000 barrels.

December crude production rose to 135,152,000 barrels from 133,646,000 barrels in November, but the daily average declined to 4,360,000 barrels from 4,455,000 barrels. Production in December, 1942, was 120,634,000 barrels, or 3,891,000 barrels daily.

Bureau statistics for 1943 showed total crude runs to stills of 1,429,738,000 barrels against 1,334,103,000 barrels in

1942, and production as follows: motor fuel, 610,533,000 barrels against 608,900,000 barrels; kerosine, 73,270,000 barrels against 67,474,000 barrels; distillate fuel oil, 211,516,000 barrels against 196,714,000 barrels; residual fuel oil, 417,306,000 barrels against 358,901,000 barrels; lubricating oil 38,679,000 barrels against 38,626,000 barrels; wax, 755,160,000 pounds against 700,560,000 pounds; coke, 1,399,200 short tons against 1,338,400 tons; asphalt, 6,756,700 short tons against 6,296,500 tons; road oil 2,295,000 barrels against 8,039,000 barrels; still gas, 312,316 million cubic feet against 284,126 million cubic feet; miscellaneous 9,660,000 barrels against 8,117,000 barrels.

Crude production by states, for the year was reported as follows: New York, 5,059,000 barrels against 5,421,000 barrels in 1942; Pennsylvania 15,757,000 barrels against 17,779,000 barrels; West Virginia, 3,349,000 barrels against 3,574,000 barrels; Illinois, 82,260,000 barrels against 106,391,000 barrels; Indiana, 5,283,000 barrels against 6,743,000 barrels; Kansas, 106,178,000 barrels against 97,636,000 barrels; Kentucky, 7,883,000 barrels against 4,534,000 barrels; Michigan, 20,768,000 barrels against 21,754,000 barrels; Nebraska, 635,000 barrels against 1,237,000 barrels; Ohio, 3,322,000 barrels against 3,543,000 barrels; Oklahoma, 123,152,000 barrels against 140,690,000 barrels; Arkansas, 27,600,000 barrels against 26,628,000 barrels; Louisiana, 123,592,000 barrels against 115,785,000 barrels; Mississippi, 18,807,000 barrels against 28,833,000 barrels; New Mexico, 38,411,000 barrels against 31,544,000 barrels; Texas 593,520,000 barrels against 483,097,000 barrels; Colorado, 2,320,000 barrels against 2,199,000 barrels; Montana, 7,916,000 barrels against 8,074,000 barrels; Utah, 4000 barrels against none; Wyoming, 33,077,000 barrels against 32,812,000 barrels; California, 284,235,000 barrels against 248,326,000 barrels.

Well completions for the year included 9726 oil wells against 10,302 in 1942, 1875 gas wells against 2100 and 6266 dry holes against 5532. The total initial production was 1,857,400 barrels against 2,841,300 barrels and average initial production 190 barrels against 280 barrels. At the end of the year 2892 wells were drilling against 2313 on December 31, 1942.

In the final month of 1943 the Bureau of Labor Statistics index for petroleum and products was 63.5 compared with 60.7 in December, 1942, and the bureau placed the operating ratio at almost 92 percent, compared with 80 percent.

Byrnes Studying Lag in Synthetic Rubber Program

Another investigation of the rubber situation was suggested last week in reports that War Mobilization Director James F. Byrnes was studying the progress of the synthetic rubber program, over the adequacy of which there is a difference of opinion.

Principal headache at the moment is the failure to complete butadiene plants as planned, that phase of the program being about 45 days behind schedule, but there is concern over the prospect that few new automobile tires will be available for civilians for many months to come.

The rubber director claims the synthetic program is moving along satisfactorily, with every prospect that production in the current quarter will meet the estimate of 166,300 tons. But military demands for rubber have increased and what was considered adequate a year ago now threatens to fall short of requirements.

The lag in the oil portion of the rubber program is attributed in part to the high priorities first given grain alcohol plants—the alcohol industry had powerful congressional support—and in part to the fact that three processes were adopted by the oil industry as against a single standardized process for alcohol.

The post-war fate of the rubber program also is said to have exerted some influence. That this is a live subject is evidenced by the exhaustive study into petroleum-alcohol competition made for the House Ways and Means Committee by the Tariff Commission.

Although the Baruch program had been offered as assuring that the United States would be over the hump after the middle of this year, the combined Raw Materials Board on February 25 foresaw that "the situation in 1945 will be further aggravated unless more natural rubber than is now in sight is forthcoming."

The need for mixing natural crude with synthetic rubber for the production of many important items, particularly tires and surgical goods, is creating a strain upon current natural crude inventories, the board disclosed.

Despite the great success to date with the synthetic program and the need for bringing it to maximum production at the earliest possible date, we are consuming natural rubber at a considerably greater rate than we are receiving it from the few sources still available to us," it declared. "Even at the lowest rate to which we can compress natural rubber consumption, supply and requirements of natural rubber will not be in balance."

East Coast Fuel Oil Is Low, Gasoline Sufficient

The East Coast fuel oil situation remains highly critical, although kerosine supplies are being maintained fairly well, but gasoline inventories are being held at a level sufficient to meet ration demand, it is disclosed February 24 in the weekly PAW Supply Bulletin.

Difficulties in the form of both air pockets on mountain peaks and new breaks in the pipe continue to hold up the Little-Big-Inch pipe line, but it is hoped that deliveries at Linden, New Jersey, will be within a week and that operations can be boosted quickly to the 120,000 barrels a day at which it is now proposed to run the line with the pumping equipment so far installed.

Bad weather and some terminal congestion adversely affected the rail movement of oil durnig the week ended February 19, during which tank car deliveries averaged only 685,471 barrels a day, 42,433 barrels less than for the preceding week.

"East Coast refineries are all operating practically to capacity," Deputy Administrator Davies reported. "The present low level of crude stocks reduces flexibility, however, and the most delicate balancing of operations is required."

Pacific API Chapter Has Program Arranged

The spring meeting of the Pacific Coast District of the American Petroleum Institute's Division of Production will be held Thursday, March 23, 1944, at Los Angeles, to consider the petroleum supply situation on the Pacific Coast, oil on the public domain, and practical problems of drilling and production technology in wartime.

Following is the tentative program: Morning: "Analysis and Use of P-V-T Data in Material-Balance Calculations," by Robert F. Loeck, Standard Oil Company of California, San Francisco; "Development and Production Performance of the Porter Reservoir, Aliso Canyon Field," by G. C. Pfeffer and A. C. Tutschulte, Tide Water Associated Oil Company, Santa Fe Springs; "Determination of the Interstitial-Water Content of Oil and Gas Sand by Laboratory Tests of Core Samples," by J. J. McCullough and P. H. Jones, Union Oil Company Research Department, Wilmington; "Should Oil Developments on the Public Domain be Encouraged?" by R. M. Allan, Jr., Superior Oil Company, Los Angeles; and "Drilling Fluid for the Completion of Shallow Wells," by W. H. Farrand and W. A. Clark, The Texas Company, Los Angeles.

Afternoon: "Controlled Water-Flood Development and Operations in the Mid-Continent," by R. C. Earlougher, Geologic Standards Company, Tulsa; "Load Problems of a Natural-Gas Utility," by H. P. George, Southern California Gas Company, Los Angeles; and "People and Petroleum," by Robert E. Allen, American Petroleum Institute, New York—followed by motion picture, "Victory's Oil."

Evening: "What Shall We Do About the Present Oil Situation in California?" by J. R. Pemberton, California state oil umpire.

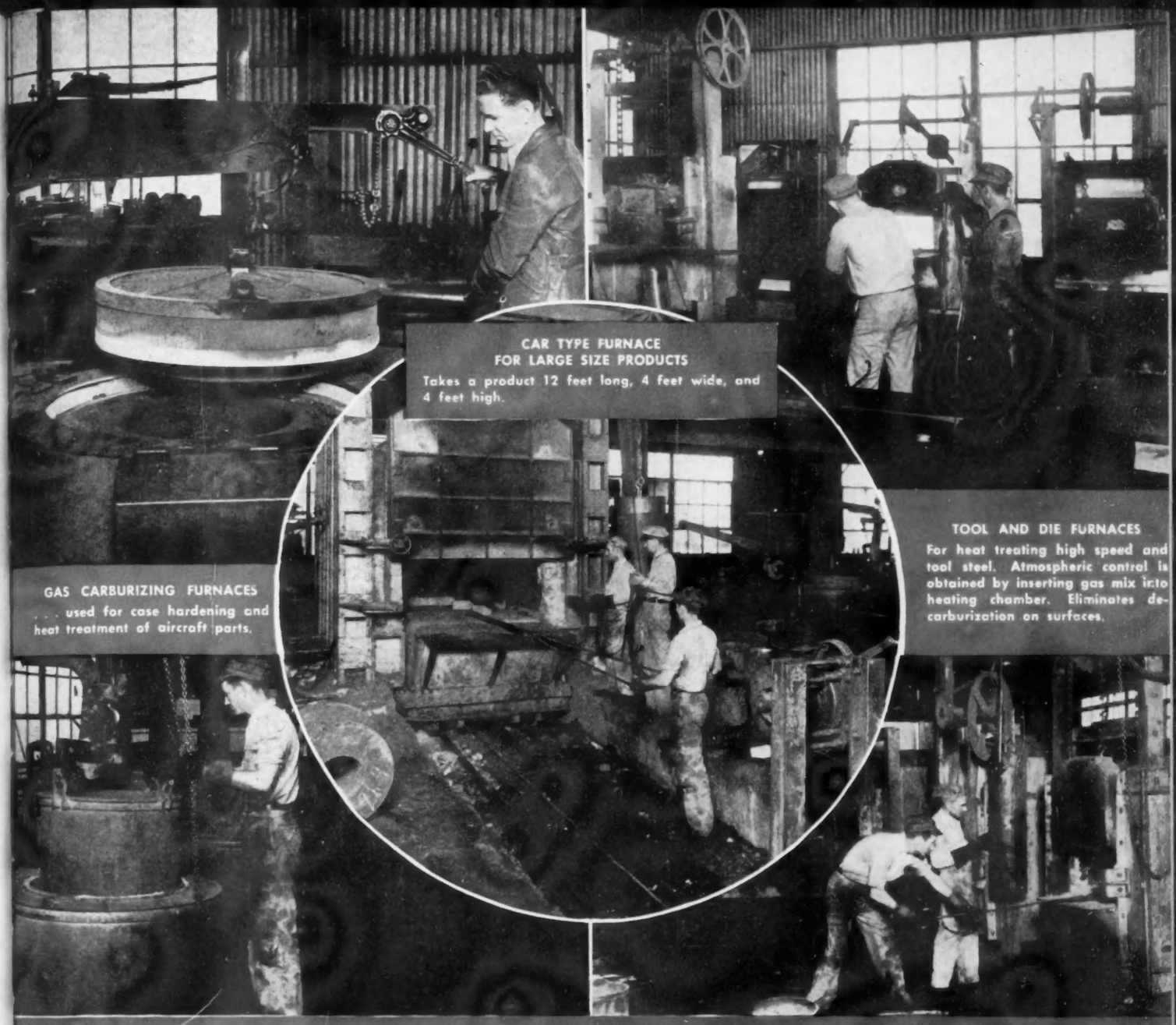
Rio Bravo Sells Holdings To D. D. Feldman

Purchase of holdings of Rio Bravo Oil Company (subsidiary of Southern Pacific Railroad) by D. D. Feldman, Dallas, Texas, was announced February 16. The trade included approximately 200 wells, mostly strippers, four rigs, pumps and all machinery used in the company's operations.

Consideration was not revealed. Producing properties involved are at Pierce Junction, Humble, Electra, Luling, South Ward and some acreage in Louisiana. The sale included around 137,000 acres of land, 50,000 acres of which was transferred in fee. The properties now produce approximately 1000 barrels daily.

Under the agreement Feldman is committed to drill approximately 15 wells within two years or spend $500,000 in development programs. Seventy-five percent of the consideration was for cash, the remainder in oil payments.

Feldman, who is head of South Oil Company and Eyangeline Pipe Line Company, owns production at Conroe, Hull and Refugio, and in Caldwell County. He announced opening of offices in First National Bank building, Houston, with J. E. Hooper in charge.



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Pratt Tells AIME of Ample Petroleum Reserves of Nation

Standard Oil Company (New Jersey) executive says prime requisite to success in finding oil in U. S. is complete freedom to explore and develop; petroleum economics discussed at New York meeting

By DON L. CARROLL, Staff Writer

UNEXPLORED sedimentary basins of the United States "hold accumulations of oil within moderate drilling depth that will be found to be at least equal in volume to all the oil we have so far discovered in this country," Wallace E. Pratt, vice president of Standard Oil Company (New Jersey) told the petroleum division of the American Institute of Mining and Metallurgical Engineers which last week held its annual session in New York. In addition, the oil producing regions of the world, the world oil situation in general, prospective postwar problems, and petroleum engineering advances came in for consideration.

"We will still not have used up our petroleum reserves when we begin to utilize the energy of the sun directly to replace coal and oil," was the assurance Pratt gave in addressing the annual dinner of the petroleum division.

"Sound geological evidence and past exploration experience shows us that the unexplored sedimentary basins of the United States hold accumulations of oil within moderate drilling depth that will be found to be at least equal in volume to all the oil we have so far discovered in this country," Pratt said.

Adequate Oil Supplies

Even though it may cause a general raising of eyebrows, when we begin to utilize the energy of the sun directly to replace coal and oil, we will still not have used up our petroleum reserves. Adequate oil supplies will continue to be available for generations to come and it can already be assumed that the world's undeveloped oil resources exceed the energy content of the world's coal reserves that are so much more easily inventoried. Sound scientific reasoning and the evidence of our observation make this thesis incontrovertible."

"The finding of oil has simply been a war casualty," Mr. Pratt declared. "As a nation, we have found other things to be of more immediate importance, and, in addition, low crude oil prices have afforded no possible incentive to drill the desired number of exploratory wells."

"Since the day that the United States found itself at war, the lack of critical materials, the lack of adequate manpower and the lack of price incentive have all combined to stifle rather effectively any real all-out effort to find new oil fields."

"The prime requisite to success in finding oil in this country has in the past always been our complete freedom to explore, and freedom to develop and produce the oil once we have found it. If the natural resources of a nation are locked up and made inviolate no enterprise of the character of the American petroleum industry can attach to them."

Mr. Pratt expressed impatience over the "confused and jittery thinking" that has prevailed with regard to the nation's petroleum resources. The confusion arises, he explained, from the failure to distinguish between proved reserves and total oil resources available to the nation. "Out of this confusion," he said, "ill-considered policies spring up and flourish—choking out the most valuable fruits of past experience in the petroleum industry."

He pointed out that it is of the utmost importance for our government, the industry and the public to realize and understand that our proved domestic reserves represent only a minor fraction of our total petroleum resources.

Post-war Control Policy

"If we could be sure that an Allied victory would mark the end of aggression in world affairs, there would be no need to consider the factor of petroleum as a measure of post-war economic control," William B. Heroy, of PAW, said at Tuesday's session.

He stressed the need for making petroleum and its products available to deserving "have-not" nations, but the application of a more tough and realistic policy with regard to those nations which, through bitter experience, we have learned to distrust—nations that could be expected to acquire stocks solely for the purpose of using them against us at the earliest opportunity.

Heroy suggested an outline of a post-war control policy, as follows:

1. Control of crude petroleum at the source, through economic and political control of producing areas, with due regard to economic interests and general development of backward countries.

2. Control of overseas transportation of crude oil and products through easily administered control of routes, destinations and cargoes of tanker vessels.

3. Control of manufacture of natural and synthetic products in aggressively-inclined nations, by a system of checks and inspections.

4. Control of national stocks through regulation of imports and the periodic checking of inventories.

5. Rigid control of the acquisition and use of aviation motor fuels.

The speaker pointed out the importance of effective agreement among the three great powers which control most of the world's oil resources, as to the manner in which world-wide controls are to be exercised.

Wednesday at the all-Institute dinner Charles V. Millikan, of Tulsa, petroleum engineer of Amerada Petroleum Corporation, was presented with the Anthony F. Lucas medal for distinguished achievement in the finding and producing of petroleum.

Because after the war there will be a surplus of tankers for transporting petroleum, the Big-Inch and the Little-Big Inch lines could well be used to bring natural gas from the prolific fields of Texas to the largest existing market, the New York-Philadelphia area, Sidney A. Swensrud, vice president of Standard Oil Company of Ohio said in presenting results of a study. The speaker analyzed the financial and competitive factors and outlined an ideal procedure in case the change-over is made.

This was one of the talks given Thursday at the all-day symposium on "Petroleum Economics" and stressing postwar problems to be faced by the oil industry.

T. E. Swigart, president of Shell Pipe Line Company, another speaker at this session, introduced detailed comparative costs of shipping crude oil by pipe line and tanker with revisions of rates made possible by improvements in designs and operations of both types of carriers. He believes the war emergency pipe lines will not be able to compete with new-type tanker vessels for deliveries from the Southwest to the East Coast.

Post-war Pipe Line Use

Swigart foresaw as warranted the use of Big-Inch and Little-Big-Inch lines for the transportation of crude oil only, but on a restricted scale after the war, namely: for deliveries from District 3 to District 2 or from District 1 to District 2 but not from District 2 to District 1. This is for possible runs of imported crude from the East Coast to the Midwest or for surplus runs from East Coast refineries but by no means directly from Texas to the East Coast. He did not suggest possibility of competitive crude from the Midwest to the East Coast by the war emergency lines after the war but instead pictured the lines as independent legs to serve refineries that cannot be served by tankers or fields that are located too far inland to feed to tanker loading docks.

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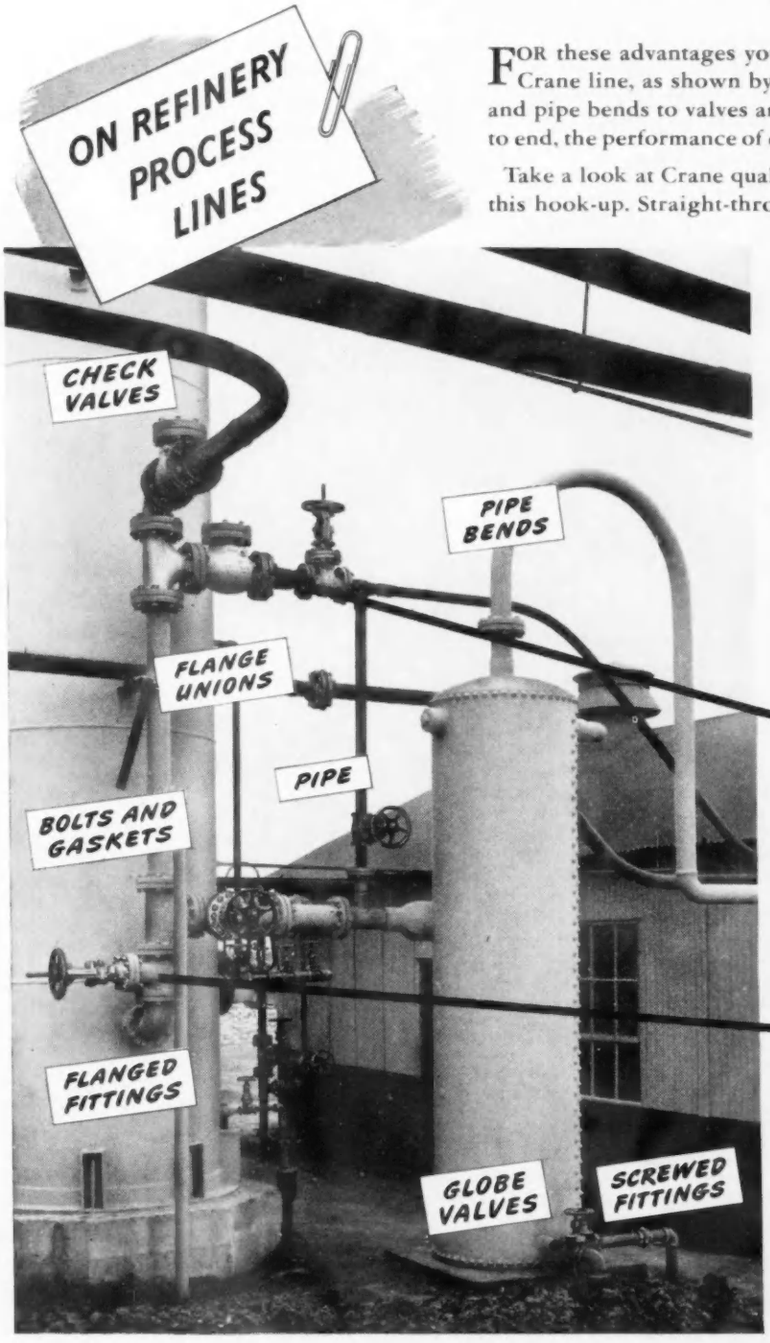

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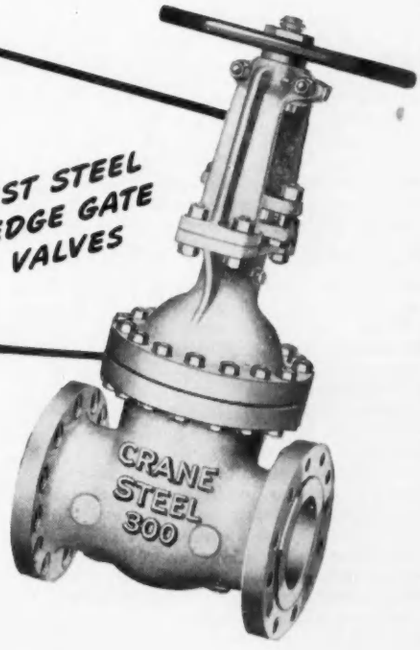

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concerned with the current measure of success of prospecting with the reflection seismograph, to the extent that last year's reflection prospects are not only this year's wildcat ventures but also next year's oil fields," said E. E. Rosaire, of Houston, in his paper on "General Considerations For Future Oil Discovery."

Rosaire traced the history of the use of the reflection seismograph with regard to initial discoveries in the Gulf Coast, and its periodic rejuvenated effectiveness as new oil pay objectives were isolated or promising prospecting territory was extended. As an illustration, he reviewed the history of development of the East Texas Basin, which was the scene of intensive seismographing campaigns from 1932 to 1937, with the determination of Woodbine structure as their objective.

"In 1939," he pointed out, "diminishing and vanishing returns made their inevitable appearance, and a distinct spirit of pessimism prevailed among East Texas geologists. Then, with the recent discovery of oil in the Paluxy and deeper horizons, a new wave of reflection seismographing has spread throughout the syncline."

He also reviewed the three discovery surges that took place in the Gulf Coast salt dome area, to show the results of employment of new prospecting methods in a supposedly thoroughly explored area. He declared it "more than mere coincidence that our major premium discoveries have immediately followed significant technological advance."

Geochemical Methods

Rosaire emphasized the immediate need for relaxing of "technical fixation" and the wider use of new methods of exploration that have been brought forward but not adequately tested, especially those methods generally called "geochemical methods" of prospecting. "Strategically sound, these various geochemical approaches must also meet a second criterion of being tactically sound, in offering the possibility of a rational approach to the discovery of petroleum at reasonable cost and within a reasonable time," he said. "The basic question is that of demonstrating the existence of recognizable modification of near-surface sediments which can reasonably be attributed to the presence of petroleum accumulations below."

Rosaire illustrated a number of phenomena in which it has been shown that petroleum accumulation has modified sedimentary environments, pointing out that these recognizable phenomena offer excellent methods of prospecting for petroleum, and therefore the opportunity of re-vitalizing currently dormant provinces or the opening of virgin provinces to production.

A petroleum policy in the Far East is not a postwar problem since development there up until the Japanese incursion was in good hands and further development there in the same hands will be carried out to the best interests of the owning companies, the various nationalities and the economic well-being of the native populations.

This opinion was expressed by Dr. H. Foster Bain, former secretary of the Institute, recently returned on the Gripsholm, who directed the petroleum geological survey of the Philippines from its organization in 1939 until Pearl Harbor.

An analysis of combined earnings

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statement of 30 oil companies for the 9 years, 1934-1942, presented by Joseph E. Pogue, vice president, and Frederick G. Coqueron, department of Petroleum Economics, The Chase National Bank, was the basis for fourteen broad conclusions regarding the industry. They were that return on invested capital in the industry is quite moderate; that concentration of capital in large concerns is less than in many other industries; and that cost of replacing developed crude reserves have been increasing in recent years.

Conclusions follow in detail:

1. The petroleum industry generates the capital needed for its expansion almost entirely from its own operations and is therefore a singularly self-contained economic unit.

2. Long-term debt contained in the financial structure of the industry is small relative to the total capital employed, is less than the net working capital, and increased but slightly during the period.

3. Capital expenditures of the 30 companies for 9 years amounted to 6.1 billion dollars, 58.3 percent of which went into crude oil producing facilities, this expenditure trending downward since 1937. In 1942, expenditures for refining facilities increased sharply and for marketing facilities declined drastically.

4. Net working capital increased 380 million dollars over the period. Favorable position of liquidity is shown by a 3.21 ratio of combined current assets to current liabilities at the close of the period.

5. Net income displayed an upward trend for the period, but with rather sharp cyclical fluctuations.

6. In 1942, government funds entered the industry for the first time in substantial amounts and were utilized for the provision of emergency war facilities.

7. The group has paid out a relatively low (55) percentage of net income in dividends.

8. Rate of return on invested capital averaged 6.4 percent for the period, compared with an average of 8.8 percent for a group of over 1100 manufacturing companies. Integrated oil companies showed a lower rate of return than producing companies.

9. Net assets for the group totaled over 6 billion dollars at the end of 1942, of which 700 million dollars, or 12 percent, were located outside the United States.

10. Net investment in properties, plant, and equipment at December 31, 1942, was distributed as follows: production, 45.6 percent; transportation, 13.7 percent; refining, 19.8 percent; marketing, 18.7 percent; and all other 2.2 percent.

11. Concentration of capital in large units is less than in many highly technological industries. The group in 1942 produced 54 percent and refined 79 percent of the totals for the country. Eighteen companies accounted for half the nation's crude oil production; and seven companies, for half its refinery throughput.

12. Combined results indicate a declining trend since 1937 in the capital expenditures per barrel of crude oil produced. An index of crude oil replacement cost shows a rising trend for the same period.

13. The group increased its crude oil production by 57 percent and its refining throughput by 43 percent between 1934 and 1942, as compared with an expansion of 25 percent in gross fixed assets, 19 percent in net fixed assets, and 11 percent in borrowed and invested capital.

14. Combined statements indicate that the oil economy is functioning soundly and effectively.

Petroleum Engineering

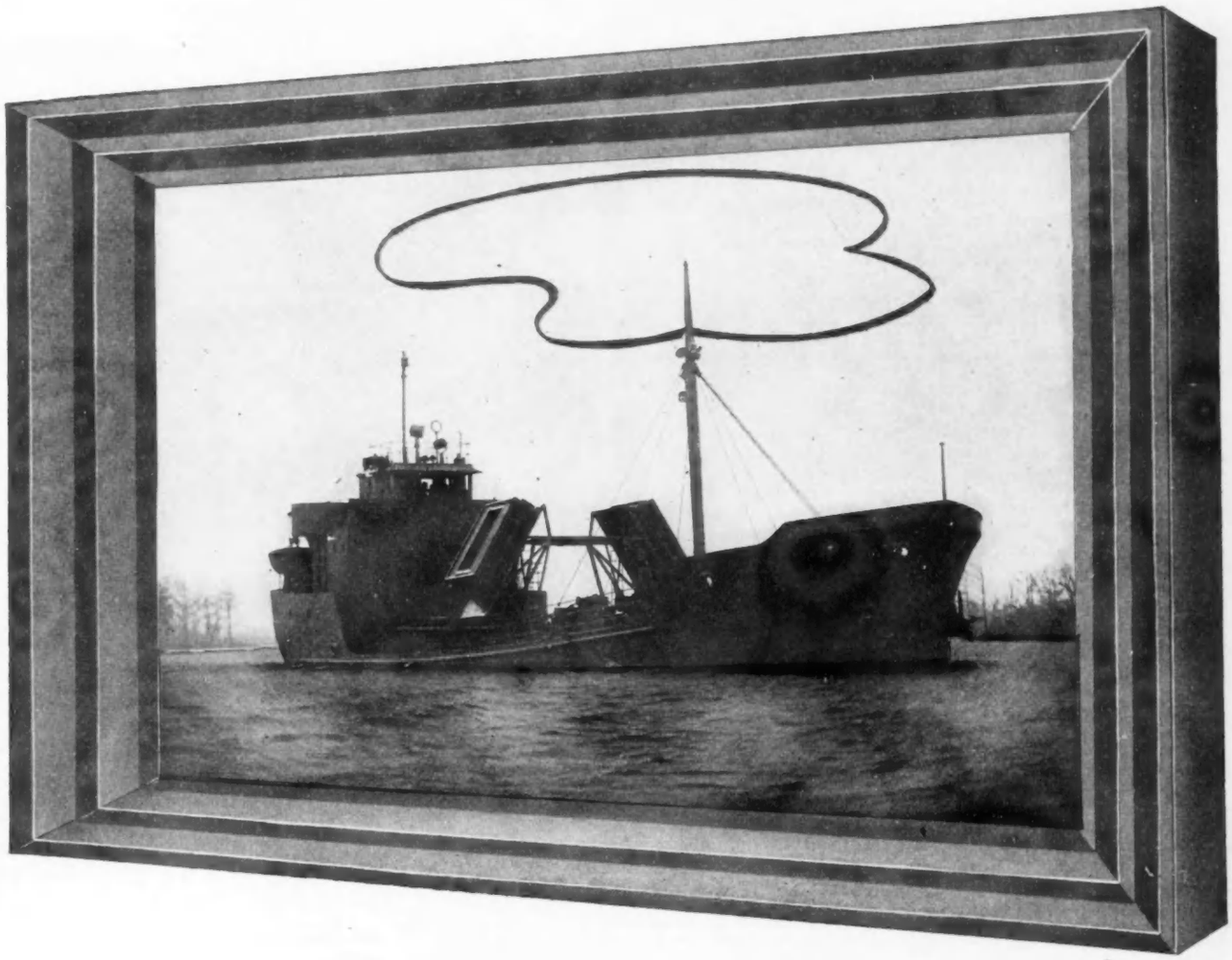
Neutralization by addition of a basic dye of the normally negative charge which bentonite carries will stablize heaving shales which cause loss of circulation and gripping of drill pipe and tools, Donald C. Bond said in a report of his research on "Positive Colloid Muds for Drilling Through Heaving Shales." Bentonite in such shales swells when water in drilling muds comes in contact with it.

The positive colloid mud prepared by addition of the basic dye to bentonitic drilling-mud clay is further improved by adding diglycol laurate which eliminates foaming and by adding small amounts of wheat flour or starch which improves stability of the mud, gel strength and filtration characteristics. The author said experience had demonstrated advantages of colloid muds over silicate muds, oil-base muds, salt solutions, heavy liquids, precipitators, special cementing techniques or mechanical methods.

Ralph V. Higgins, petroleum engineer of the United States Bureau of Mines cited the proved advantages of the gas lift as: large capacity, the fact that no moving parts are required in the well, that the gas-lift principle is applicable to deep wells and crooked holes, and is not defeated by excessive amounts of silt; back pressures are controllable, with respect to the decrease of gas-oil ratios and control of coning of bottom-hole water; fluid mechanics are similar to those of flowing wells, and flowing life of wells are prolonged.

Lifting of water by air involves none of the problems of solubility associated with gas lifts and natural flowing wells, and a new method of designing air lifts makes it possible to predict the performances of gas lifts and natural flowing wells, he said.

The author showed that when air lifts are operating at maximum efficiencies the mean velocities of air and water mixtures vary slowly with dif-



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ferences in pipe diameters, but rapidly with submergence ratios, thus indicating that the amount of submergence is a controlling factor, and one that is usually overlooked. In oil wells the ratio of the pressure at the well head to that at the bottom of the tubing is definitely proportional to the ratio of submergence of the air lift.

Sidewall Coring

A. W. Wadill described a new device for sidewall coring with a retractable core barrel operating through the drill pipe as it remains in the hole. This procedure permits continuous circulation and uninterrupted mud conditioning and cores can be taken and withdrawn by wire line at the rate of one per hour, at depths of as much as 5000 to 10,000 feet. The coring assembly is oriented for desired deflection by use of a mule shoe, working on a helix angle, and a mule-shoe guide inserted within the main body of the tool. The formation is cored at an angle of approximately 30 degrees with the axis of the drill collar. The fall of the coring assembly to the point of anchorage is checked and cushioned by a deflector coil spring. The core tube is forced into the formation by slightly lowering the drill stem to furnish the required weight. Lifting of the drill stem returns the core tube to its original position.

Frio Brines

A study of oil-field brines in the Frio formation on the Texas Gulf Coast by Frank W. Jessen and F. W. Rolshausen showed that the brines vary in chloride content from 3180 to 73,000 parts per million, according to depth of burial, the highest concentrations being noted at depths of more than 5500 feet. Within the formation greatest salinity of the waters occurs in the upper 300 feet, the concentration becoming lower with increasing depth locally.

Brines from wells in Starr County have less concentration of dissolved salts than those in wells farther north along the strike. The overall study included analyses of brines from 50 separate fields and 4 wildcat wells. Hole depths of the wells to the Frio horizon ranged from 2500 to 11,400 feet, and within the formation from 2 feet to 2686 feet below the Frio top.

Smackover Water Drive Unit

Data on 12 separate Smackover limestone producing areas, all in Southern Arkansas were presented by W. A. Bruce who established the Smackover as a continuous porous unit, in which withdrawals from any pool have important effects on the behavior of all other pools in the area. Water drives of individual pools are dependent upon the permeability and porosity conditions that prevail in the formation throughout the area and Bruce suggested that reservoir behavior of existing and future pools can be predicted.

The method of reservoir performance analysis used by the author was not mathematical, but involved an electrical device to establish the average values of permeability and compressibility, and to identify and correct anomolies caused by large-scale barriers anywhere in the formation or small barriers surrounding or adjacent to pools.

IPAA Head Says Arabia Pipe Line Puts Government in the Oil Business

With a broadside of objections against the proposed government pipe-line venture in Arabia, Ralph T. Zook, president of the Independent Petroleum Association of America, speaking recently at Bradford, Pennsylvania, charged that the United States government has entered the oil business. "Here we have the first step toward a government-managed oil industry," he asserted. "In the final analysis building of the line means that the oil industry of the United States will pay taxes to finance the means of putting itself out of business.

Thousands of oil operators, land owners and employes in the industry would lose through the activity of a government corporation paying no taxes and supported by taxes collected here at home, the speaker declared. Then setting a policy for the association, he expressed determination to do everything in his power as president to kill the Petroleum Reserve Corporation as now constituted.

Except for the fact that the line is to be started soon, it is in no way a wartime project and can contribute nothing toward winning the war. On the contrary, there is a strong likelihood that the war effort will actually suffer if the line is built. "Important shipping space would be deviated to the movement of supplies to Arabia. With a manpower shortage here at home, many hundreds would be sought for the pipeline building. Steel mills would be asked to use part of their capacity to make the pipe. The whole project would be a gigantic undertaking, at this time," Zook warned.

The oil industry here at home would also suffer immediate handicap through diversion of steel to the line, in his opinion. "Our producing industry in the United States has been running at half speed for two years so far as development and exploratory work are concerned. Through rationing of materials and freezing of prices, expansion of activity was prevented. Now, after denying steel for drilling wells to improve oil supply from our fields, it is proposed to take thousands of tons of steel out of the limited supply and use it 6000 miles from home."

Taking issue with the view that we have about run out of oil in the United States, the justification for the line, Zook cited the fact that many oil men oppose such a theory. "From the beginning of the oil industry, it has been necessary to keep on exploring. We will continue to find oil if we drill for it."

Pressure will be brought by the rulings heads of Iran and Iraq to increase production in their respective countries, upon completion of the proposed line. Terming reserves in the two countries as fabulous, the IPAA president predicted that "instead of 400,000 barrels daily flowing to the Mediterranean, there will be a million or more barrels daily. The next step will call for construction of a refinery on the Mediterranean, followed perhaps by other pipe lines and more refineries—all built with United States' taxpayers' money."

This means that oil will come into the United States in competition to our producers. "Oil can be brought to the United States at a figure which will not permit any increase in price to the domestic producer. Arabian oil can be brought to the Eastern Seaboard, after making allowance for difference in quality between the Iraq oil and East Texas crude, at $1.50 a barrel, allowing at the same time a reasonable profit."

Taking PAW Administrator Ickes to task for inconsistencies in statement of policy and actions, Zook referred to repeated statements by the administrator that he had no intention of putting Petroleum Reserves Corporation into the oil business. "Three days later it was announced that the Arabian pipe line contract had been arranged. It would be government constructed, owned and maintained. The agreement limited the market outlets of the companies to restriction defined by the Department of State. It also would hold a reserve for the government of a billion barrels of oil to be sold to the government at 25 percent below the market price."

"Is that going into the oil business, or isn't it?" he demanded.

The Independent Petroleum Association of America has expressed itself in a positive manner against the state socialistic theory implied in government participation in the oil industry either at home or abroad. The president stated that the association "will at the proper time issue a comprehensive analysis of the effects of the proposed pipe line on the citizens of the United States and the domestic oil industry."

Two Companies Plan Pipe Line in Venezuela

Creole Petroleum Corporation and Mene Grande Syndicate have nearly completed plans for constructing a jointly-owned 16-inch pipe line from the Mulata field, in the northwestern part of the State of Monagas, Venezuela, to the seaboard terminal at Puerto de la Cruz, 13 miles north of Barcelona.

The 102-mile line will run from a point just east of Santa Barbara almost due west to the vicinity of San Mateo, from which point it will parallel the present Mene Grande line to the coast.

The line will employ only one pumping station, at the field end, according to present plans, although it is expected to operate at capacity of 90,000 barrels (33 gravity oil).

Actual construction of the line will be delayed until necessary trucking roads can be put through, to span a 50-kilometer gap in the present road system. Total cost of the project is estimated at approximately $6,000,000, of which $1,800,000 will be expended on all-weather road construction.

Company officials state that the new line will probably be completed and in service before the end of the year.

Oil Compact Meet

The executive committee of the interstate oil compact commission will meet April 3-4 in New Orleans, Secretary Charles Orr has announced. Originally the meeting was set for March 31-April 1.

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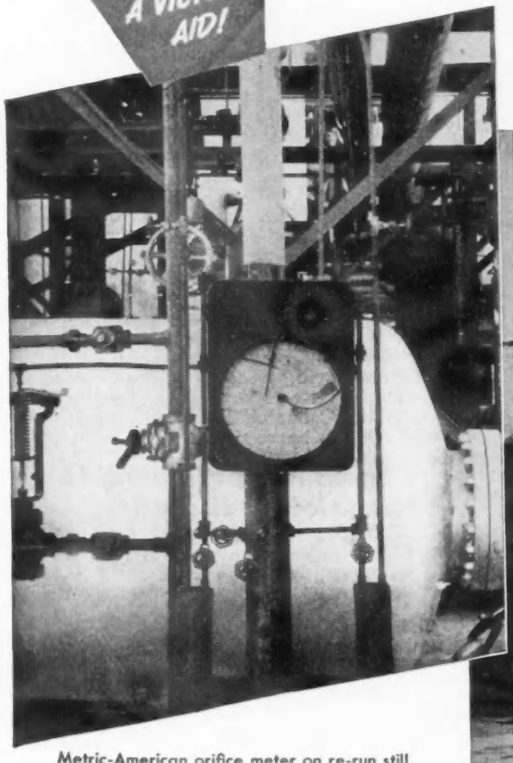

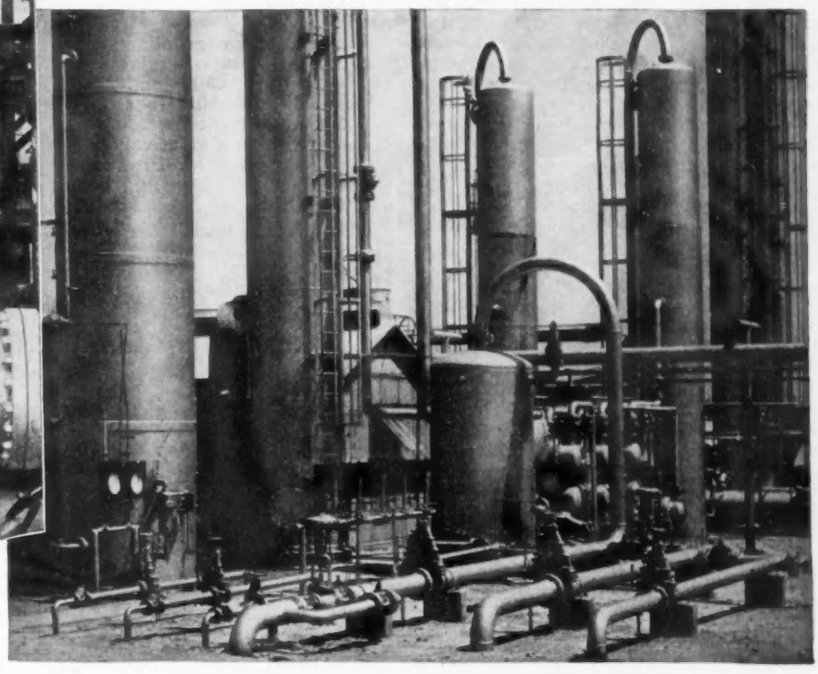

Metric-American orifice meter on re-run still.

IN PETRO-CHEMICAL PROGRESS, pilot plant and new technology can take full advantage of proven instrument performance. Where time is precious, and new equipment at a premium, trial-and-error methods in the selection of instruments have short shrift.

During a century of steady technological advance, American Meter Company measurement instruments have pioneered first in the gas industry and then in the petroleum industry. *The long sustained accuracy of its present instruments is equal to the smallest visible reading on test gage or chart.*

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1934

Industry Drawing Steadily on Stocks Of Crude in Meeting Enormous Demand

Wartime strain on the industry's oil wells and refineries continues unabated, as evidenced by latest weekly statistics, covering week ended February 19, released by the American Petroleum Institute. Refinery runs are very high, and it has been necessary to draw steadily on crude stocks in keeping the plants running at necessary rates.

Crude-oil production was down 14,000 barrels from the previous week's daily average in running at 4,385,000 barrels daily in the week of February 19, although it was 511,000 barrels a day or 10.5 percent greater than in the corresponding week a year ago.

Crude stocks were reduced 939,000 barrels (134,000 daily) in the week of February 12, after having declined 1,106,000 barrels the preceding week, and then stood at 238,206,000 barrels. The crude inventory is 4,000,000 barrels or 1.7 percent larger than a year ago.

Crude runs to stills were 112,000 barrels a day greater in the week of February 19 than in the previous week, and in averaging 4,340,000 barrels daily, nearly as much as domestic production, were above the year-ago level by 672,000 barrels daily or 18.3 percent. Refining capacity was being utilized to the extent of 89.8 percent, or close to the rate at which operations can be consistently maintained.

Production of gasoline was stepped back upward, in consequence of larger crude runs to stills, and there was a normal accumulation in storage. Refinery output of light fuel oil also was increased, although relatively heavy drain on stocks continued. Production of residual fuel oil declined, but without adverse effect on stocks.

Gasoline production, including natural blended at refineries, was 32,000 barrels a day greater than in the previous week in totaling 13,326,000 barrels in the week ended February 19, and the output was 430,000 barrels a day or 29 percent larger than that in the like week a year previously. Stocks of finished and unfinished gasoline were increased by 230,000 barrels daily, but in spite of rising to 83,931,000 barrels, the inventory was nearly 8,000,000 barrels or 8.6 percent short of the 91,823,000 barrels on hand February 20 a year ago.

Refinery output of gasoil and distillate fuel showed an increase of 55,000 barrels over the daily rate of the previous week and 52,000 barrels or 9 percent over the rate in the corresponding week a year ago. It was necessary to draw on storage to the extent of 163,000 barrels daily, and the inventory of 33,709,000 barrels on hand February 19 was 2,413,000 barrels or 6.7 percent less than the 36,122,000 barrels in storage February 20 last year.

Residual fuel oil production was off 16,000 barrels daily from the previous week in totaling 8,881,000 barrels in the 7 days ended February 19, but the output exceeded that in the like week a year ago by 195,000 barrels daily or 18.2 percent. Stocks of residual were increased by 73,000 barrels daily for the week, having risen to 52,965,000 barrels, but the latter quantity was less than the 70,371,000 barrels held a year before by 17,406,000 barrels or 24.7 percent.

Kansas March Allowable Far Below Indicated Demand

The March allowable production for Kansas was set at 275,000 barrels, the same as for February, by the Kansas

Crude Oil Production in the United States

(Estimates compiled by The OIL WEEKLY. All figures indicate daily averages, in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED February 26	February 19
Alabama	25	25
Arkansas	78,750	78,800
California	827,150	824,500
Long Beach	29,700	30,400
Midway-Sunset	56,500	56,000
Kettleman Hills	43,750	43,200
Wilmington	102,000	101,000
Rest of State	595,200	593,900
Colorado	6,900	8,450
Florida	50	50
Illinois	206,200	211,450
Salem	26,200	25,250
Louden	32,400	31,600
Other New Pools	135,800	142,450
Old Pools	11,800	12,150
Indiana	12,450	14,350
Kansas	279,700	268,050
Kentucky	20,100	22,900
Louisiana	360,600	360,700
North Louisiana	77,200	77,200
South Louisiana	283,400	283,500
Michigan	53,500	53,400
Mississippi	43,850	42,600
Missouri	100	100
Montana	24,968	22,500
Nebraska	1,200	1,150
New Mexico	113,000	113,250
New York	13,200	12,500
Ohio	9,050	8,750
Oklahoma	324,300	325,400
Oklahoma City	47,000	47,500
Seminole Area	67,550	70,100
Rest of State	209,750	207,800
Pennsylvania	38,450	40,200
Tennessee	30	30
Texas	1,916,500	1,909,750
Upper Gulf Coast	516,550	516,650
East Texas Field	390,700	390,500
Rest of Eastern Texas	116,900	110,300
Lower Gulf Coast	193,100	193,200
Southwest Texas	75,250	75,250
South Central Texas	20,000	19,950
West Texas	362,100	362,100
North Texas	140,000	139,750
Panhandle	101,900	102,050
Utah	15	15
West Virginia	8,000	8,000
Wyoming	95,400	98,500
Total United States	4,433,488	4,425,420

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

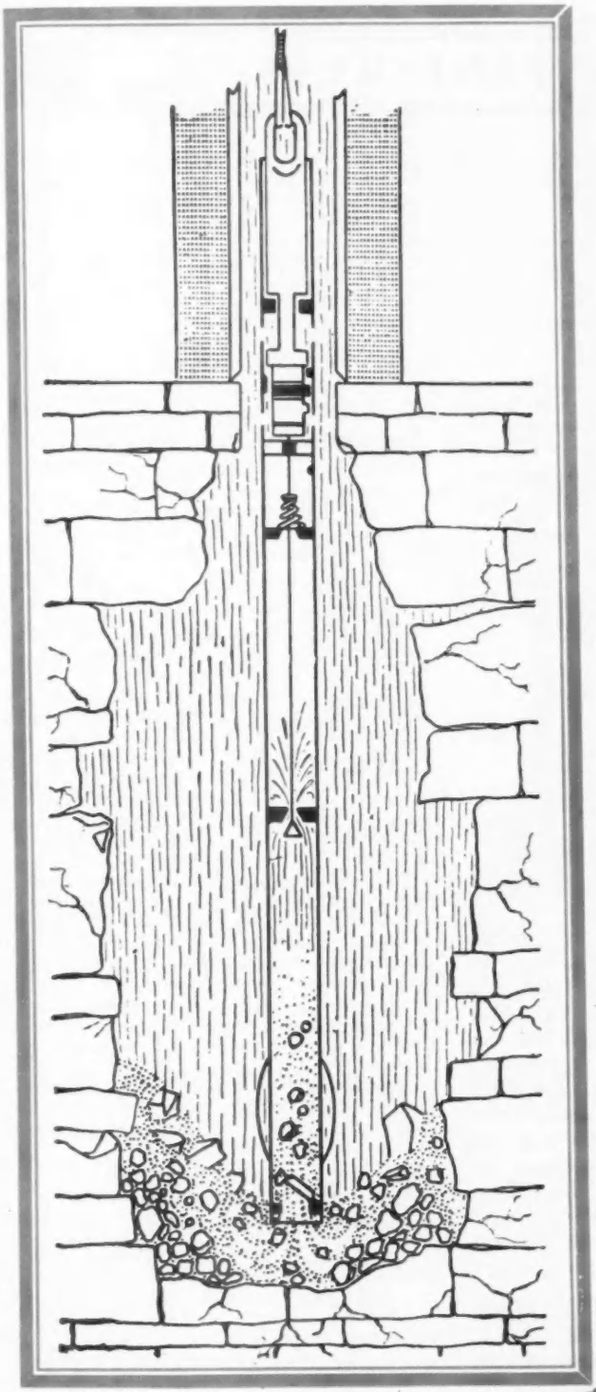
HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod. Barrels Daily	Week Ended	Runs to Stills Barrels Daily	Week Ended	Crude Stocks Barrels	Week Ended	Gasoline Stocks Barrels	Week Ended	Gasoil and Distillate Stocks Barrels	Week Ended	Residual Fuel Oil Stocks Barrels	Week Ended
Highs:												
1941	4,337	11-22	4,120	10-18	266,187	3-29	99,727	3-29	[1]54,983	11-15	102,448	1- 4
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	49,861	11-14	95,857	1- 3
1943	[1]4,436	11-13	4,331	12- 4	245,752	5-29	94,159	3-20	46,187	11-27	72,881	1- 2
1944	4,409	1-29	[1]4,453	1- 1	240,992	1- 1	83,931	2-19	42,310	1- 1	57,330	1- 1
Lows:												
1939	[3]1,601	8-26	3,125	2-18	[2]229,127	10-12	71,152	10- 7	20,722	4-15	105,397	4- 8
1941	3,364	1-11	3,490	1-18	240,399	11-15	79,923	10- 4	28,381	4-12	90,914	7-12
1942	3,297	7- 4	3,393	5-23	231,896	12-12	75,934	12- 5	29,240	4-25	72,962	12-26
1943	3,821	1- 9	3,579	3-13	232,191	1- 9	68,182	10-16	30,732	4- 3	57,596	12-25
1944	4,357	1- 1	4,228	2-12	238,148	1-15	76,302	1- 1	33,709	2-19	52,453	2-12

TRENDS OF 1943 AND 1944

Trends in Week Ended:	Crude Oil Production Daily	Runs to Stills Daily	Stocks Week End	Gasoline Production Weekly	Gasoline Stocks Week End	Gasoil and Distillate Production Weekly	Gasoil and Distillate Stocks Week End	Residual Fuel Production Weekly	Residual Fuel Stocks Week End
1943:									
January 2	3,871	3,734	233,938	10,957	82,420	4,285	42,913	7,683	72,881
January 30	3,826	3,698	233,863	10,339	88,830	3,888	37,057	7,452	70,763
February 27	3,873	3,709	235,217	10,566	93,157	4,230	32,939	7,839	70,140
March 27	3,896	3,742	239,126	10,231	94,079	3,541	30,980	8,018	67,938
April 24	3,913	3,737	242,035	10,583	91,001	3,954	31,142	8,168	67,455
May 29	3,970	3,679	245,752	10,656	83,937	3,798	32,274	7,672	67,682
June 26	3,955	4,015	242,657	11,092	79,589	3,876	34,044	8,126	67,960
July 31	4,133	3,788	238,420	11,127	74,977	3,765	36,363	8,478	66,877
August 28	4,196	4,227	236,170	12,420	72,525	4,351	37,928	8,732	67,250
September 25	3,344	4,156	233,013	12,206	70,024	4,608	40,328	8,560	66,659
October 30	4,383	4,176	237,219	12,813	69,297	4,642	44,591	7,968	63,838
November 27	4,414	4,261	239,761	12,638	69,980	4,379	46,187	8,633	62,143
December 25	4,363	4,185	241,310	12,597	74,024	4,457	43,791	8,689	57,596
1944:									
January 1	4,357	[1]4,453	240,992	13,192	76,302	4,575	42,310	9,141	57,330
January 29	4,409	4,359	240,251	13,427	81,085	4,054	37,266	8,889	52,857
February 5	4,400	4,324	239,145	13,192	81,784	4,138	36,023	9,087	52,734
February 12	4,399	4,228	238,206	13,101	82,322	3,946	34,854	9,000	52,453
February 19, 1944	**4,385**	**4,340**	.....	**13,326**	**83,931**	**4,331**	**33,709**	**8,881**	**52,965**
February 20, 1943	3,874	3,668	[4]234,239	10,323	91,823	3,970	36,122	7,520	70,371
Change:									
In week	—14	+112	—939	+225	+1,609	+385	—1,145	—113	+512
In year	+511	+672	+3,967	+3,003	—7,892	+361	—2,413	+1,367	—17,406
In year	+10.5%	+18.3%	+1.7%	+29.1%	—8.6%	+9.1%	—6.7%	+18.2%	—24.7%

[1] All time peak. [2] Lowest since April, 1922. [3] Lowest since October, 1922, due to shutdown of six Mid-Continent States. [4] Stocks February 13, 1943.



Note above how the surging action of the **CAVINS BAILER** "sucks" in all foreign material from wall and bottom of hole.

CLEAN YOUR WELL *Thoroughly*

BEFORE RUNNING PLASTIC PLUG

Running of Plastic Plug to plug back is a comparatively new, but highly successful, means of effecting water shutoff. The Plastic Plug is therefore widely used today.

The success of the Plastic Plug is definitely dependent upon one thing: The hole *must be clean all the way to bottom* to allow maximum penetration of the plastic and thereby assure the highest possible percentage af water shutoff. If the hole is not cleaned of foreign materials, including possible hole cavings, then the plastic is likely to penetrate sands too far up in the hole, causing a hazard.

The CAVINS HYDRAULIC BAILER is paving the way for successful Plastic Plug jobs today just as it has paved the way for numerous other well jobs for many years. The surging action of the CAVINS BAILER "sucks" in (see illustration) all loose and movable materials from the walls and bottom of the well. It breaks down corrosive conditions existing in many wells making salt water, thereby permitting the plastic a far better chance to penetrate water-carrying sands.

If it becomes necessary to remove any part of a Plastic Plug from a well, the CAVINS HYDRAULIC BAILER (with the proper cutting attachments for various size holes and conditions) is likewise your fastest, surest and least expensive tool for this job.

CAVINS now has a Depthometer Service for getting correct measurements for bottom-hole depths . . . another valuable addition to the Industry's first and most successful clean-out service.

Call CAVINS for clean-out work prior to running Plastic Plug. Call CAVINS for all clean-out work!

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HYDROSTATIC FISHING TOOLS • SWABS • DEPTHOMETER SERVICE

Corporation Commission at its parley held late last week. The commission's order disregarded Petroleum Administration for War request for 291,000 barrels a day.

Purchasers submitted nominations for 348,824 barrels a day, some 155 barrels a day less than they asked for February.

The Oklahoma Corporation Commission will meet March 1 to consider the March allowable.

Osage Lease Sale

Auction of oil and gas leases in Osage County, Oklahoma, is scehduled for 1:30 p.m., March 15, at Pawhuska, when 75 tracts, all but a few being 160 acre units, are to be offered. The acreage ranges from 20-12e to 24-8e, and from 23-6w to 25-3w.

PIPE LINE REVIEW

Segregation of West Texas Sweet Oil Arranged

Facilities for the segregation of sweet crude produced in the Kermit-Ellenburger and the Keystone-Ellenburger fields from nearby leases that yield regular West Texas quality of oil are being provided through a joint arrangement between Magnolia Pipe Line Company and Gulf Refining Company. The sweet crude will be moved from the district in batches by pipe line and become available to refineries that are not equipped to process sour oil. Magnolia's four-inch line currently handling mixed grades of oil from both areas to its tank farm and main line station at Wink will be relieved of the sour oil connections. Gulf will take over the latter and also install a separate gathering system for Ellenburger production in the Keystone field, making deliveries to Magnolia through a three-mile four-inch line.

Gulf Increasing Line Capacity in West Texas

Gulf Refining Company has awarded contract to Sharman and Allen, Houston, for the installation of 5 loops, aggregating 75 miles of 10-inch pipe to boost the capacity of its West Texas 10-inch looped trunk line to Ranger from 70,000 to 80,000 barrels daily. The project also involves the laying of two 8-inch units, aggregating 41 miles of line, in East Texas to permit the delivery of a maximum of 16,000 barrels of Permian Basin oil daily to the War Emergency Pipelines' Longview terminal. Pipe deliveries are scheduled to permit construction to start early in March.

The longest loop will consist of a 17-mile unit between Judkins and Midland stations with a 9-mile unit on the discharge side of the latter. Loops will straddle the Coahoma and Roscoe stations, affording maximum capacity of 90,000 barrels daily to Sweetwater, where the line serves Gulf Refining Company's refinery. The Permian Basin oil designated for the big-inch system will be routed through an 8-inch trunk line via Fort Worth to Saltillo Junction, Hopkins County, thence south through the company's Mid-Continent multiple system. A 13-1/3-mile 8-inch loop will be built south from Saltillo and a 27½-mile 8-inch extension from Big Sandy station to Longview tankage of the big-inch system.

Bayou Pipe Line Has Successful First Year

The Bayou Pipe Line System, 300 miles of products line from Houston and Texas City to Baton Rouge, and a miracle of salvage in construction, on February 15 completed a year of service. The line, originally projected in 1942 to feed the Plantation Pipe Line from Baton Rouge to Richmond, Virginia, direct from Gulf Coast refineries, was financed privately by pipe line subsidiaries of six major oil companies, and the Shell Pipe Line Corporation was selected to design and construct the Bayou system, and to operate it for the duration.

Every mile of pipe that went into the Bayou system came from obsolescent equipment earmarked for the junkman, or from crude oil pipe line which was less vitally needed at the moment. In most cases, it was necessary to shape construction plans to fit available reconditioned equipment.

The line carries premium and house-brand gasoline and kerosine of six companies: Humble Oil & Refining Company, The Texas Company, Shell Oil Company, Pan American Refining Com-

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pany, The Pure Oil Company and Crown-Central Petroleum Corporation. It replaces tankers and barges in feeding the Baton Rouge terminals of the Plantation Pipe Line, making possible a continuous stream of oil products from Texas City to Richmond, a distance of 1262 miles. Designed to deliver an average of 57,000 barrels a day, the line has crowded through 66,440 barrels and regularly averages 63,500 daily.

Buddrus Heads New Natural Gas Association

E. Buddrus, Panhandle Eastern Pipeline Company, Chicago, was named president of the newly organized Independent Natural Gas Association of America at a meeting of the directors at Tulsa, February 18.

The association was organized to promote and advance the welfare and interests of producers and transporters of natural gas and to serve members before the Federal Power Commission and the Securities Exchange Commission.

Other officers include Paul Kayser, El Paso Natural Gas Company, El Paso, first vice president; J. H. Dunn, Shamrock Oil & Gas Company, Amarillo, second vice president and F. W. Peters, Oklahoma Natural Gas Company, Tulsa, treasurer.

East Texas API to Meet In Kilgore, March 8

The first spring meeting of the East Texas Chapter API, division of production, will be held March 8 at the Kilgore Hotel, Kilgore, with Bryan W. Payne of Tyler as chairman. "The Magic of Fire" will be presented by G. M. Kintz, United States Department of Interior, Bureau of Mines, and a movie, "Electronics at Work" will be shown. Several short talks also are scheduled, L. J. Nelson, secretary, has announced.

Immensity of Near East Oil Reserves Described

Speaking before the Petroleum Club at Dallas last week, E. DeGolyer, recently returned from an inspection trip of the Persian Gulf and other Near East oil fields, said that American oil companies own comparatively few concessions and that British and other European interests control the bulk of the reserves which, he said, "are the largest in the world, adding up to many billions of barrels to which American oil reserves cannot be compared."

DeGolyer said American concessions are mostly along the rim of these large reserves, which have been fairly outlined by only 153 wells, and that the fields, while not particularly extensive in area, owe their vast production potentials to great sand thicknesses.

Humphrey Sells Leases

Thomas D. Humphrey, Dallas operator and drilling contrator, completed the liquidation of his producing properties with the sale of the Dorsey, Guitar, Rust and Triplett leases in Jones County, West Central Texas, involving 100 barrels daily from 6 wells, to Onyx Refining Company for $60,000 cash. Humphrey recently sold a 20.32-acre lease in the East Texas field for $1,500,000 cash. He will continue to operate his cable tools and rotary rigs.

International Developments

Americans Reported Seeking Turkish Concession

In the expansion of American interests in oil of the Near East, development in Turkey looms as a possibility. Reports from Ankara via Ottawa, Canada, have stated that American interests are seeking concessions from the Turkish government, to develop oil resources on a basis of one half of production to Turkey and the other half to the developers.

The private interests would build port installations and arrange all other transportation from the wells, under plans reportedly discussed.

The Turkish policy for years has been to avoid control of natural resources by foreign capital.

Colombia Wildcat Effort Gets Results

Wildcatting was predominant in the substantial drilling program carried out in Colombia during the past year and likewise will feature the impressive development program scheduled for this year. The exploratory efforts of 1943 were gratifying, and at the end of the year the country was credited with total potential production of over 70,000 barrels daily or 26,000,000 annually.

Colombia's production of 13,261,065 barrels (36,332 daily) in 1943 was 26 percent above the 10,428,273 barrels of 1942, and exports were up 46 percent. Although refinery runs were down 1¾ percent, Colombian plants supplied all aviation gasoline needed by the Colombian government and the requirements of two major oil companies, while turning out lubricants of higher grade than they formerly could make.

Along with the active drilling campaign, Colombia experienced brisk bidding for national concessions in 1943, and out of 82 applications filed 8 became contracts, while 20 more of the 82 applications became contracts in January of this year. Up to January 15, 212 applications had been filed, all told, of which 100 had been accepted by the Ministry of Mines and Petroleum. Colombia now has 1,235,000 acres under lease to private individuals.

On the De Mares concession, Tropical Oil Company completed 3 wells that included one flowing 665 barrels daily, one fair-sized pumper, and a dry gas well that later was made into a 150-barrel pumping oil well. The company was drilling two wells as the year ended. Its potential production at that time was estimated at 55,000 barrels daily.

Colombian Petroleum Company completed 3 wells averaging 500 barrels daily initial production of high-gravity oil and 1 well yielding 175 daily of 22-gravity oil, and at year-end had 12,000 barrels daily potential production.

The Shell interests have completed an important discovery well in the Department of Magdalena, yielding 45-gravity oil, although not in large volume, and are drilling three other wells in the district. In the Meta Department, Shell is drilling an interesting test in the Llanos country. In the Casabe field, Shell completed 6 wells in 1943, averaging 500 barrels daily of 20-gravity oil, along with 2 dry holes, and was drilling another as the year ended. That field at year-end was credited with 4000 to 5000 barrels daily potential.

Richmond Petroleum Company completed only dry holes in 1943 but continues drilling.

Socony-Vacuum Oil Company completed a 260-barrel 21-gravity oil well and a dry hole in Cimitra Concession and is drilling a third test.

Lend-Lease Funds Sought For Oil Work in Mexico

Efrain Buenrostro, manager of Petroleos Mexicanos, is expected to arrive in Washington on February 21 to consummate a deal under which the United States government would finance expansion of oil facilities in Mexico.

Plans reportedly call for expansion of the Mexico City refinery, building of a pipe line to that refinery from the Poza Rica oil field; and repressuring of the Poza Rica.

Financing, as planned, will be with lend-lease funds, through the export-import bank, and Petroleum Reserves Corporation will not have a hand in the program.

While in Washington, Buenrostro is expected to confer with officials of the Lend-Lease Administration, the State Department, PAW, and representatives of Phillips Petroleum Company.

All aviation gasoline made available by the new refining facilities in Mexico City would be used only by commercial air lines operating from or within Mexico.

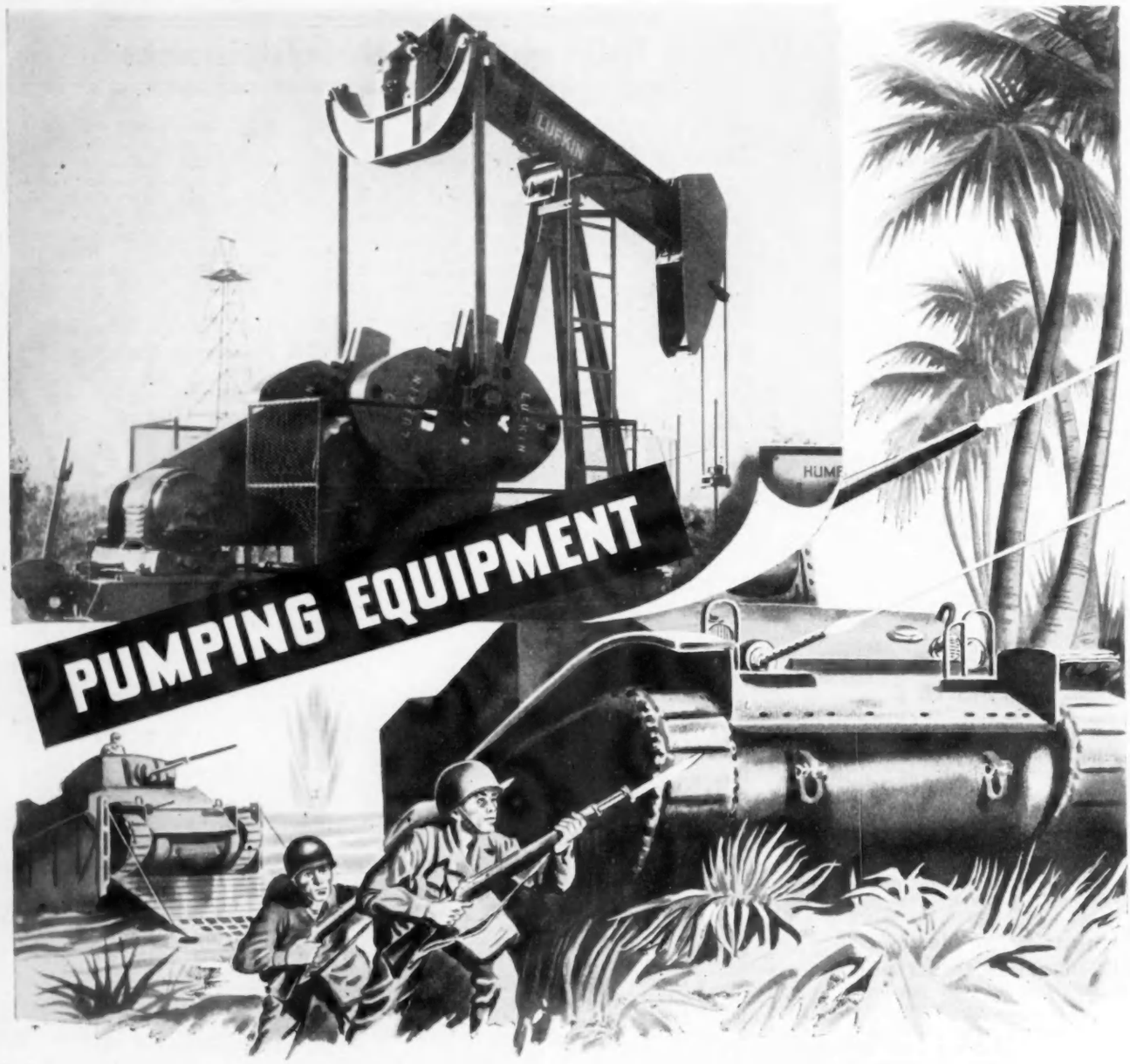
Swedish Shale Oil Production Increases

During the more than three years that Sweden has been prevented from receiving crude oil or products imports, a government-controlled shale oil industry has been developed that had grown to a capacity of more than 5,000,000 barrels per year, as of August, 1943. It is believed that the shale is hauled from mines in Norway, and in the western mountains of Sweden, to processing plants near Stockholm. Since some of the oil recovered is sent to Germany, through exchange, Swedish consumers are turning to synthetic spirits for use as motor fuel, using a by-product of the cellulose industry for this purpose.

Extension Confirmed for South Taber Field

Information made available on January 18 confirms the previously reported discovery of a commercial pay in the Taber sand, in the Mid-Continent Oil and Gas Company No. 3, second wildcat 3 miles south of production in the Taber field, Alberta. The company has announced that 34 feet of saturation was cored in a 36-foot section of the sand. The lower 2 feet is water-bearing. The water will be cemented off after the Ellis sand is tested, 100 feet lower. The Taber pay will yield a fair recovery, on the basis of a satisfactory drill-stem test made on January 17.

Six more locations remain to be drilled on the company's block. No. 1 was a failure on the east side of the structure.



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LUFKIN
PUMPING UNITS

U. S. Field Operations

Alabama

Second Well Planned; To Build Loading Rack

Hunt Oil Company has made location for an east offset to Alabama's discovery well, now flowing 60 barrels of 20-gravity oil a day from 2800 feet in the Selma chalk, after failing in the Massive sand of the Tuscaloosa. The new location is Jackson 2, C SE NW 2-10n-4w, Choctaw County.

The discovery well is located on a large block of leases owned by Hunt Oil Company, which is reported preparing to build a loading rack to handle the oil. Another deep wildcat is planned in another part of the section.

Illinois Basin

New Harmony Found Productive at Shallow Depth

Probably the most outstanding development in Illinois this week was discovery of a new producing horizon in the New Harmony pool of White county.

Superior Oil Company's Greathouse 15, NW NE SE 4-5s-14w, located on a lease which has been highly profitable, is nearing completion as a Pennsylvania sand producer from pay at 717-727 feet after a 20-quart shot. On initial test the well made 25 barrels of oil and no water daily.

Other tests of the sand will be made in the area and operators are of the opinion that 25 to 30 barrels per day production will prove highly profitable in view of the shallow depth and lessened drilling costs of such wells. The discovery probably will cause exploration of the field which extends from Grayville south to Ribyre Island.

Coles County: C. A. Beckman is completing Herman Community 1, NE SW SW 25-12n-7e, as an Aux Vases sand discovery in the Mattoon area. Following a 10-quart shot at 2004-08 feet, the well was cleaned out and then filled 700 feet with oil in approximately two hours. Tanks have been installed at the site and the operator is now moving in pumping equipment. An offset location probably will be made soon.

Cumberland County: F. D. Walker and associates' Shields 1, SE SE 21-10n-8e, southeast of the village of Trilla, is shut down awaiting decision of operators as to whether to drill deeper in search of Devonian lime production or abandon the apparently dry hole in the St. Louis lime at 2541 feet. A slight show of oil was recovered in the Pennsylvania sand. The well is in wildcat territory.

Madison County: The Marine pool continued to take on importance as a Devonian producing area. Sinclair Wyoming Oil Company's Hess 1, NW SW 10-4n-6w, northeast of the village of Marine, swabbed and flowed 878 barrels of oil natural in 16 hours from Devonian at 1718-21 feet. Total depth of the hole is 1768 feet. Ohio Oil Company is testing pay at Grotefendt 1, SE SE NE 9-4n-6w with hole bottomed at 1747 feet.

Jefferson County: In the Markham City North pool, Central Pipe Line Company's Holloway 1, SE NE 13-2s-4e, showed for another good McClosky-lime producer. During a drill-stem test, the well made gas in 4 minutes and yielded 2700 feet of oil in 30 minutes. Casing has been set for test.

Wabash County: First National Petroleum Trust and associates' Courter 2, SE NW SE 7-1s-12w, a west extension test of the Mt. Carmel pool, is drilling below 1500 feet.

In the West Patton area, C. E. Skiles has completed Schmitt 1, NE NW SE 20-1n-12w, in McClosky lime at 2344-48 feet for 320 barrels of oil daily after 5000 gallons of acid.

Kentucky

A new McClosky lime pool was in prospect for Union County, Kentucky as a result of preliminary tests at The Texas Company, and Ashland Refining Company's Culver 1, 12-P-20, 2½ miles northeast of production in the Uniontown pool. During a drill-stem test of McClosky lime at 2521-31 feet, the hole filled 1300 feet with oil in one hour, and casing is being set to test.

Kansas

Three Small Discoveries Reported During Week

Three new pools were opened during the week just closed. While all were small discoveries they indicate Kansas operators are trying.

Mineral Products Company's Reif 1, NWc SW 30-16-12w, 1½ miles southwest of Bloomer pool, Barton County, pumped 30 barrels of oil in two hours from the Arbuckle lime at 3390 to 3404 feet.

Phillips Petroleum Company's Wyman 1, NW NE SW 21-26-9w, made 93 barrels initial from Viola lime at 4188 feet, to open the Lerado Southwest pool of Reno county.

Atlantic Refining Company's Neill 1, NWc NE 27-24-11w, opened Richland pool, Stafford County, making 2221 barrels from the Arbuckle lime at 4240 feet.

Dickey Oil Company's Mills 1, C SW SW 32-31-14w, northwest of Deerhead pool of Barber County, may open a new pool. After carrying the hole to 4842 feet in the Simpson sand, making 12 feet of pay, the zone was plugged off and Viola lime tested at 4685 feet. A further testing at 4470 to 4503 feet and at 4419 to 4441 feet the hole filled 3100 feet with fluid, most of it oil.

West Edmond Operators Plan Engineering Committee

An operating and engineering committee to survey and study bottomhole pressures in the West Edmond field of Oklahoma and Canadian Counties and to discuss the advisability of continuing the field's present 300-barrel-per-well allowable, will be formed by field operators when they meet with Walter T. Pound, chief conservation officer, in Oklahoma City, March 1.

Oklahoma

Pauls Valley Area May Be Getting Another Pool

Stanolind Oil & Gas Company may be giving the Pauls Valley area of Garvin County another Pennsylvanian pool. The hope was centered on Beaty 1, NE NW NE 22-3n-1w, and a core from 4140 to 4155 feet carried good stain and odor. Operators are making the hole tight and will not release complete data until the Ordovician sediments are tested.

Nearest production is in 36-4n-1w and 31-4n-1e, to the northeast in the Pauls Valley pool proper.

Grady County: Skelly Oil Company and others Goodwin 1, C SE NW 8-5n-8w, is claiming considerable attention since a stray sand at 7508 to 7524 feet revealed gas and light staining. The stainings are in the Pennsylvanian, and Ordovician is expected soon.

Cleveland County: Mid-Continent Petroleum Corporation's Tubbs 1, NE SW SE 29-10-3w, the 40-acre east offset to the discovery well of West Moore pool, was drilling below 8266 feet in Hunton lime, and Harris 2, NE NE SW 20-10-3w, below 7155 feet.

McClain County: Carter Oil Company's Cottingham 1, C SE SW 4-7n-3w, near the town of Washington, is below 10,998 feet, and looking for "third" Wilcox sand. The same company's Johnson Ranch 1, C SW NE 13-8n-4w, near Blanchard is drilling below 10,505 feet. First test had showings in the top of Wilcox sand, and the latter shows in the base of Pennsylvanian, and also in Hunton lime of Ordovician. Viola lime yielded slight staining.

Oklahoma County: Fox & Fox's Peterson 1, C NE SW 19-14-4w, extended West Edmond pool nearly a mile north by completing in Hunton lime at 6894 to 6940 feet, for 121 barrels an hour. Pay was penetrated by 100 shots in casing and acidization. It became the thirty-first producer there, being thirtieth in Hunton lime and with one from Bartlesville sand.

Operators meet March 1 with Walker T. Pound, conservation officer of Oklahoma Corporation Commission to form a West Edmond Operators Committee. Daily production is above 11,000 barrels and under strict proration.

Atoka County: Northern Ordnance et al's Fulton Ranch 1, SE SW SW 19-1s-12e, near Stringtown, spudded with 20-inch surface to 315 feet. Operators plan test to 9000 feet, but report it may be reamed and carried to 12,000 feet. This wildcat is on a structure which A. I. Levorsen, former president of the American Association of Petroleum Geologist, says contains five pools.

West Texas

Pecos County Wildcat Showing Starts Five Tests

Standard Oil Company of Texas' Mac-Der Company 1, Pecos County wildcat that recently tested 6,000,000 feet of gas with spray of oil and drill-

ing fluid from perforations at 4723-28 feet, established the water level in deepening to 4770 feet, and will be deepened. Drill stem test at 4740-70 feet yielded 2250 feet of sulphur water. The producing zone originally was called Ellenburger, but it later proved to be the Wolfcamp, or Basal Permian. Five tests on short-term leases in the general area have been authorized on the strength of the showing made by this wildcat, and lease prices reached a peak of $600 per acre, half cash and balance payable from production.

Phillips Petroleum Company's Byrne-Pascoe 1, 2 miles southwest of the Owego pool's Ellenburger discovery, reached Permian-granite wash contact at 4445 feet with elevation 2448 feet, and abandoned at 4645 feet in solid granite. The company's University-Pecos 1, 8 miles south of the Wentz pool, was drilling lime at 6015 feet, and Price 1, the record depth test for the district, was drilling lime and shale at 13,575 feet.

Winkler County: Stanolind Oil & Gas Company's Sealy-Smith 1, indicated Clear Fork discovery for the south portion of the county, continued to show broken oil saturation in coring to 6233 feet, and may establish the water level before running pipe for completion. This wildcat rated at 10 barrels 43-gravity oil hourly and 1,500,000 feet of gas daily on drill-stem test at 6088-6133 feet. In the Keystone-Ellenburger field, Amon G. Carter and Pure Oil Company's Walton 3-C, north offset to their deep discovery, entered Ellenburger at 9314 feet, being 88 feet low, and was due to run tester after coring to 9374 feet in gas cap zone. Sinclair Prairie Oil Company's Walton 4-A, west outpost that topped at 9163 feet, or 68 feet high, was drilling at 9555 feet, possibly in an oil zone. No test has been made since recovering gas-distillate at 9163-9258 feet. The discovery logged a 307-foot gas-distillate zone in Ellenburger before entering oil pay at 9524 feet. In the Wheeler-Ellenburger pool, Mid-Continent Petroleum Corporation's Wheeler 1 and Stanolind-Shell's Wheeler 1-A, northeast and west outposts, respectively, were drilling at 10,567 feet and 10,564 feet. Both are somewhat lower than the discovery.

Ward County: Shell Oil Company's Sealy-Smith 3, second Ellenburger completion for the Monahans pool, will be plugged back again due to bs&w increasing to 20 percent. Production is from perforations at 10,350-10,410 feet.

Crane County: Gulf Oil Corporation's Waddell et al 45, SWc PSL 27, Block B-26, established new pay for the northeast sector of the Sand Hills structure in flowing 308 barrels the first hour and 384 barrels the second hour, averaging 4 percent bs&w, on open-flow test from McKnight sandy-lime at 3230 feet. The gas volume was rated at 8,000,000 feet daily. Production may be from crevice, as returns were lost at 3144-90 feet and the well made a prolific flow following a blowout at 3230 feet. However, nearby 4100- 4300-foot producers logged favorable showings in this upper zone, which produces in the McKnight pool, situated to the north and possibly on same general structure.

Brewster County: W. B. Hinton et al's Texas American Syndicate 1a, Hovey dome prospect, logged the Simpson-Ellenburger contact at 8365 feet with an elevation of 4233 feet, and broken oil saturation was found at intervals in coring to 8465 feet. Drill-stem test at 8400 feet failed due to leak in pipe, and test at 8263-8465 feet yielded 2000 feet of rotary fluid and fresh water. This wildcat was originally carried to 7777 feet in 1938 by Floyd C. Dodson et al, and it will be carried to water. It is the first test in the general area to reach the Ordovician.

Prospects: Stanolind Oil & Gas Company's Cobb 1, Northwestern Hockley County strike from saturation at 4639-69 feet in San Andres, topped at 3610 feet with elevation of 3570 feet, failed to alter the volume of bs&w in plugging back to 4654 feet and acidizing. The well averages 5 to 6 barrels of fluid hourly, estimated 50 percent oil, on swabbing tests, and is due to be equipped for pumping. More tests in the area are assured.

In Yoakum County, Hickok Producing and Drilling Company and Harry Reynolds' Price 1, C NE NE Section 342, tested a small volume of water at 5301 feet, and will plug back to make swabbing test of oil saturation, topped at 5245. This wildcat entered San Andres at 4530 feet with elevation of 3743 feet.

Humble Oil & Refining Company's Fillingim 1, 3⅓ miles northwest of west edge of the Wasson field, recovered 45 feet of oil- and gas-cut rotary fluid when tester was used at 5133-5242 feet in San Andres, topped at 4580 feet, and was drilling at 5455 feet on a 5500-foot contract.

New Mexico Producing Properties Change Hands

Buffalo Oil Company, Dallas, has contracted for the purchase of the capital stock of the Maljamar Oil & Gas Company, discoverer of Maljamar, oldest field in Lea County, New Mexico, for $3,025,000. The consideration is based on an agreed price of $5.50 per share. The pioneer New Mexico company has a gross allowable production of 1500 barrels daily from 56 wells embracing about 3000 acres in the Maljamar field, and about 9000 acres of outlying leases, which includes a block bearing a wildcat pumper.

North Texas

Eastern Cook Discovery Flows 110 Barrels

Northern Ordnance, Inc.'s Davis 1, recent strike near Woodbine, eastern Cooke County, flowed 110 barrels of 28-gravity oil, averaging 1.6 percent bs&w on official gauge through 12/64-inch choke from Basal Strawn sand at 4348-57 feet. The company has authorized 4 nearby tests.

Jack County: Standard Oil Company of Texas and Hanlon & Buchanan's J. E. Moore 1, W. Berrman survey, uncovered first Strawn pay for the Ellis 4800-foot pool in recovering 400 feet of oil and 150 feet of oil-cut mud when tester was used in sand at 3626-37 feet. Pipe has been landed on bottom for completion through perforations. This new pay is on the north edge of production. L. T. Burns et al's Bowen-Gulf 1, second test for a geophysical prospect, centering upon the Jack-Clay County line, cepletion in Bend topped at 4981 feet, being mented pipe at 5130 feet to try for com-68 feet high to a 5152-foot failure situated ⅞ mile to northeast. Bowen-Gulf 1 logged broken oil saturation in Ellenburger at 5980-6119 feet but porosity was subnormal.

Wilbarger County: The Texas Company's Cook 1, east offset to the company's main pool 2786-96-foot Gunsight lime oil discovery, set pipe at 2844 feet or 6 feet off bottom to complete through perforations having logged oil sand at 2485-91 feet and Gunsight saturation at 2793-2803 feet. The Texas Company's Bankers 1, wildcat and 3 miles south of the main pool, was drilling granite wash at 5295 feet.

Wichita County: W. H. Rogers Trustee's Shappell 1, Block 16, G. W. Childres survey, has opened a new Ellenburger producing area for an old shallow pool situated 1¾ miles south by east of Iowa Park by swabbing 5 barrels of fluid hourly, 50 percent oil after initial treatment with 1000 gallons of acid in broken dolomite at 5087-5108 feet.

East Texas

Two Deep Producers On Sand Flat Structure

Prospecting on the Sand Flat structure, Smith County, netted two oil producers from Paluxy sand the past week, thereby establishing a field for the deep-seated Tyler Basin. Skelly Oil Company's Chisum 1 was flowing 3 barrels of oil hourly through one-eighth-inch choke with 100 pounds pressure on tubing and 350 pounds casing pressure. Production is from perforations at 6972-7025 feet opposite the Upper Paluxy. This prospect junked the lower section of the hole in trying to make an oil producer from the 9200-foot Rodessa, Arkansas Fuel Oil Company's Marsh 1, ½-mile southeast, was standing with hole full of oil and awaiting pumping unit after testing 10 barrels of 21-gravity oil hourly on swab from perforations at 7080-7118 feet. Sun Oil Company's Patterson 1, west outpost and a failure in the Paluxy, was drilling at 8530 feet to explore the Rodessa.

Camp County: Mid-Continent Petroleum Corporation's McGahee 1, 4 miles northwest of Pittsburgh, has attracted attention due to high structural position for the area in entering Woodbine at 4140 feet with elevation of 429 feet, and was drilling shale at 4450 feet.

Franklin County: Tide Water Associated-Seaboard interest's Campbell 1, fourth dual-pay completion for the Hope field, established a new and deeper pay in flowing 205 barrels of 53-gravity oil initial through 9/64-inch choke from Travis Peak sand at 8156-90 feet. This well also gauged 259 barrels initial on same size choke from the regular Bacon zone at 7260-78 feet.

Van Zandt County: Superior Oil Company of California's Groves 1, prospective oil discovery from Travis Peak that has been idle for several months pending installation of a centrifugal pumping unit, pumped 56 barrels of 35-gravity oil with a small amount of water on 24-hour test. Production is from perforations at 8552-70 feet.

Navarro County: Brown & Wheeler's Gibson 1, Julian Fontenoy Survey, tested salt water on initial perforations at 6765-74 feet in the lower porous section of the Rodessa, topped at 6651

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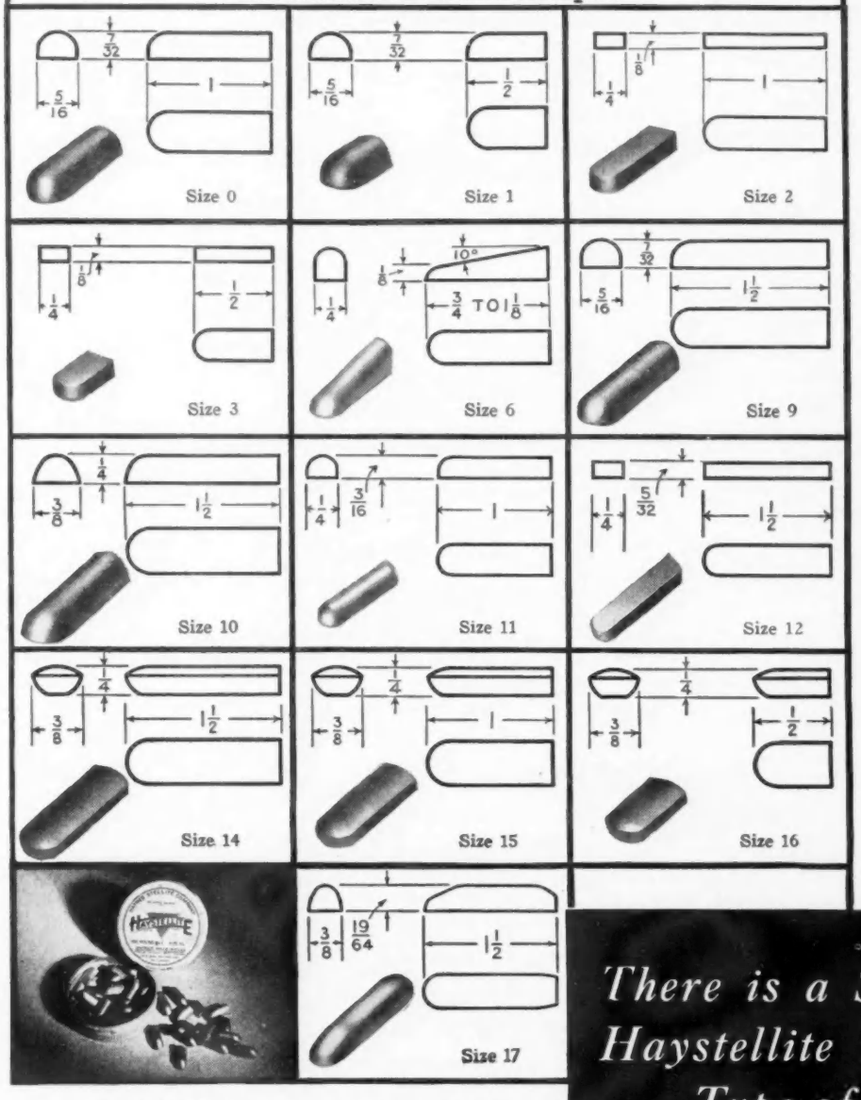

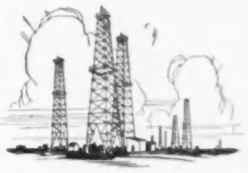

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feet. Next perforations are due to be made in oil saturation at 6555-63 feet in the massive anhydrite, then the Rodessa will be tested from the top down by stages.

Manziel Outpost: Amerada Petroleum Corporation will try for a 2-mile southwest extension for the Manziel field in starting Sheppard 1, located on west 40 acres of 100-acre lease, Sam Burch Survey. The southwest portion of the field was materially enlarged by 3 producers, which are listed under current completions. Shell Oil Company's Whatley 1, southeast outpost, yielded a small show of oil with rotary mud in making drill-stem test of casing perforations at 8755-85 feet, having plugged back from 9005 feet. Swabbing test will be made through tubing, then possibly acid treatment.

Wood County Wildcats: Gulf Oil Corporation's Brewer 1, Ben Lee Survey, 2⅓ miles southwest of Winnsboro, was due to perforate a possible gas-distillate zone in Rodessa at 8265-86 and 8314-27 feet with water below 8385 feet. This prospect entered Travis Peak at 8700 feet and was drilled to 8719 feet. Magnolia Petroleum Company's Lindley 1, Yantis area, logged nominal oil saturation in Rodessa before entering water at 7812 feet, and was drilling hard sand 7945 feet.

Smackover Tests: A. G. Hill et al's Anderson 1, Robertson County faulted structure, is credited with entering the Smackover section near the 9600-feet level with base of gravel beds at 10,020 feet, and was halted at 10,288 feet with drill pipe stuck. Although no shows have been logged below the Trinity series, this prospect has established the presence of the Smackover at a reasonable depth along the Mexia-Luling fault trend.

In Franklin County, Humble Oil & Refining Company's Hague 1 was drilling shale 10,550 feet.

Southwest Texas

Jim Wells County Gets Two Wells in New Pay

Several new pays have been opened on the Lower Coast and in Southwest Texas. Magnolia Petroleum Company has completed two wells in a new pay at Seeligson in Jim Wells County. The Seeligson 56 was dual completed but the new sand was perforated at 4647-52 feet after topping pay at 4595 feet. The well flowed 324 barrels daily through ¼-inch choke, the working pressure building up to 575 pounds, gas-oil ratio mounting to 1930/1, the oil 40.5-gravity. The well is on east flank and is 1320 feet west of Humble Oil & Refining Company's King 20, near the Kleberg County line.

Magnolia Petroleum Company's Seeligson 57 was perforated in one sand at 4654-57 feet and flowed 111 barrels daily through 7/64-inch choke, the sand being topped at 4620 feet. The No. 19 sand zone showed too much gas at 5950-80 feet.

San Patrico County: Seaboard Oil Company has completed Bomer 1 at Odem for 102 barrels through ⅛-inch choke. Perforations were made at 6781-83½ feet in a new sand topped at 6775 feet. Gas was logged in the regular field sand section at 6696-6712 feet.

Extension: Magnolia Petroleum Company is completing a new pay sand and major extension 2 miles southwest of the Burnell-Wilcox field. Ingram 1 flowed gas-distillate from perforations at 6660-70 feet after logging pay section at 6654-92 feet. The Luling discovery sand was logged at 6750-83 feet.

Duval County: Hiawatha Oil & Gas Company is testing a new sand in a northwest outpost in Longhorn field. Miller 15, 4100 feet northwest of nearest production, recovered 270 feet of oil-cut mud and 850 feet of oil in 15 minutes on a drill-stem test at 4495-4535 feet. Casing was cemented near bottom and tanks erected for completion. The field regularly produces from the 4000- and 4900-foot levels.

Jackson County: Amerada Petroleum Corporation has completed Graves 2 in a new Frio sand zone at North LaWard. The well flowed 56 barrels through 5/64-inch choke from perforations at 5818-23 feet after drilling to 8010 feet and setting 5½-inch casing to 6157 feet and plugging back to 5830 feet. Location is in block 11, Pickering Ranch subdivision.

J. A. Gray has opened a new producing zone in Harmon-West Mauritz area with McCrory 1 flowing 96 barrels through 7/64-inch choke. Perforations were made at 5398-5402 feet after topping sand at 5398 feet and setting 5½-inch casing to 5483 feet. Depth is 5623 feet.

Texas Gulf Coast

Deep Wilcox Test for San Jacinto County

Another deep Wilcox test is in making with Shell Oil Company requesting permit to deepen a west flank well at Mercy, San Jacinto County, to 14,000 feet. The well is Central Coal & Coke 11 and is located in James Robinson survey. Details concerning the well have not been revealed, although the hole is now bottomed around 12,100 feet. Other deep Wilcox wells are at Lake Creek in Montgomery County.

Colorado County: Jack W. Frazier and Cities Service Oil Company are retesting Gay 1, Wilcox discovery 3 miles northwest of Columbus, after testing only salt water in perforations at 7320-24 feet. The well flowed gas and distillate and some water from perforations at 7810-12 feet, and flowed some oil and water at 7664-68 feet. The hole was plugged back and perforated at 7320-24 feet, where the recovery was salt water.

Harris County: First activity in years is projected for Joyce Richardson field area with General Crude Oil Company preparing to drill Rorick 1 on a 465-acre lease in J. C. Ogburn survey. Location is in lot 22, 3500 feet southwest of Josey 1. Projected depth is 7500 feet.

Wildcatting: Drilling of new tests is showing a gain. Ohio Oil Company, main operator in Markham and North Markham fields, is preparing to drill a 9900-foot test 4 miles northeast of Blessing in Matagorda County. It is Hefflefinger & Hermanson 1 on a 296-acre tract in P. Burnett survey on lot 18. Continental Oil Company is interested in the area.

Houston County: John S. Ivy and W. T. Moran are preparing to drill Murray & Sons 1, 6000-foot Wilcox test 22 miles southwest of Crockett. Location is on a 642-acre lease in John Durst survey, 2500 feet northeast of Trinity River.

South Louisiana

Deep Hole on Pine Prairie Flank Testing

Gulf Refining Company is making first test of a deep well on the east flank of Pine Prairie dome, Evangeline Parish, one of the most active areas on the coast. Details on Schlicher-Thomas 2 have not been released, although a sand showing oil in Wilcox was reported around 9952-75 feet. Vicksburg was topped at 7386 feet, Cockfield at 8444 feet, Cook Mountain at 8760 feet and Wilcox at 9826 feet. Depth is 11,000 feet in shale, although 5½-inch casing is not set to bottom. The well is in Section 37-3s-1w.

On the west flank, Gulf Refining Company is testing in Wilcox at Schlicher-Thomas 1-B, Section 35-3s-1w, having set 5½-inch casing to 10,554 feet after drilling to 10,555 feet. The company is still drilling in Schlicher-Thomas 7-A, Section 3-4s-1w, on the south flank of the dome, now below 7975 feet.

Calcasieu Parish: W. T. Burton has completed reworking his deep sand discovery on the flank at Starks dome. Lutcher-Moore 10, Section 13-9s-13w, was completed originally in perforations at 8040-60 feet for 113 barrels daily through 3/32-inch choke but began to show mud and sand. The holes were squeezed and new perforations made at 8045-55 feet for 145 barrels daily through ⅛-inch choke, tubing pressure 2725 pounds, casing sealed. The oil is 46-gravity while the fluid in the first perforations was 39.1.

Terrebonne Parish: Superior Oil Company is making first test on Continental Land and Fur Company 1, wildcat in Bayou Penchant area, Section 30-18s-14e. The hole is bottomed at 11,828 feet with casing set to 11,277 feet. First perforations were to be made at 9929-35 feet. Details as to what was logged were not announced.

St. Landry Parish: The Texas Company is trying to sidetrack Swift 1, Section 14-55-7e, wildcat 2½ miles northeast of Krotz Springs, which blew out from 10,617 feet and sprayed gas and distillate for 6 hours. The well was killed partially but could not be completely controlled.

Wildcats: Union Sulphur Company is still fishing for stuck drill stem in Daigle 1, wildcat in Section 49-7s-2e, southwest of Church Point, which tried to blow out from a sand at 9815 feet. Hole has been cleaned to 4840 feet.

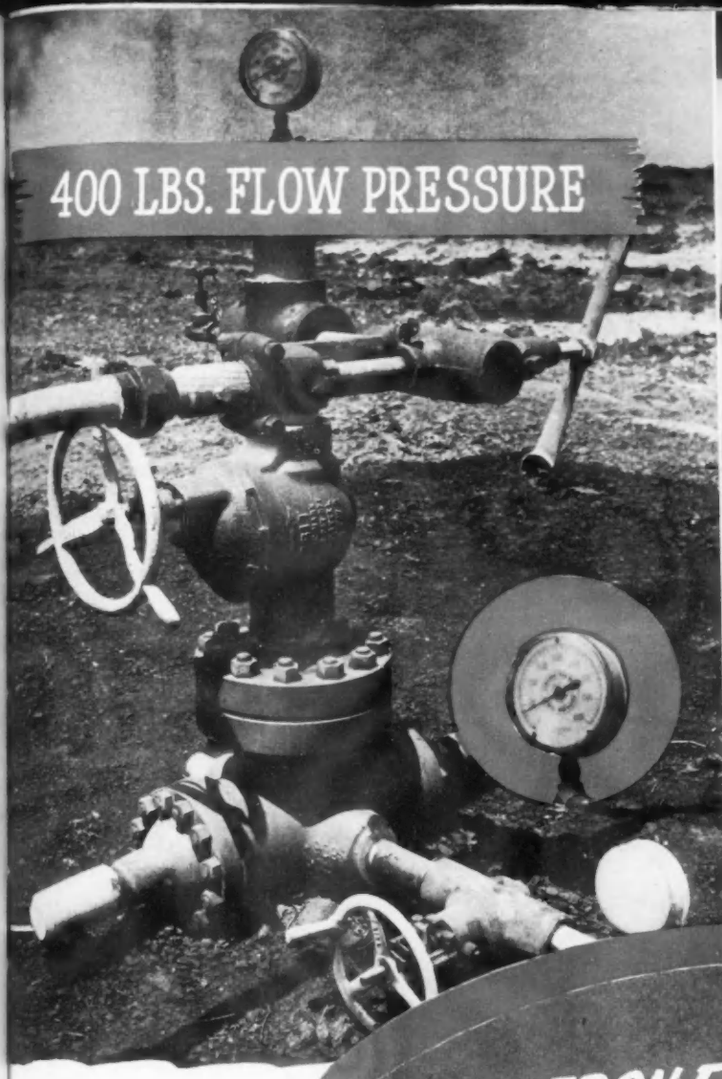
Humble Oil & Refining Company is preparing to drill a 11,500-foot wildcat in Labadieville area of Assumption Parish, Robichaux 1, Section 100-14s-15e; the same company has spudded Cameron Parish School Board 1-B, proposed 11,500-foot test in Catfish Lake area of Cameron Parish, Section 16-14s-5w.

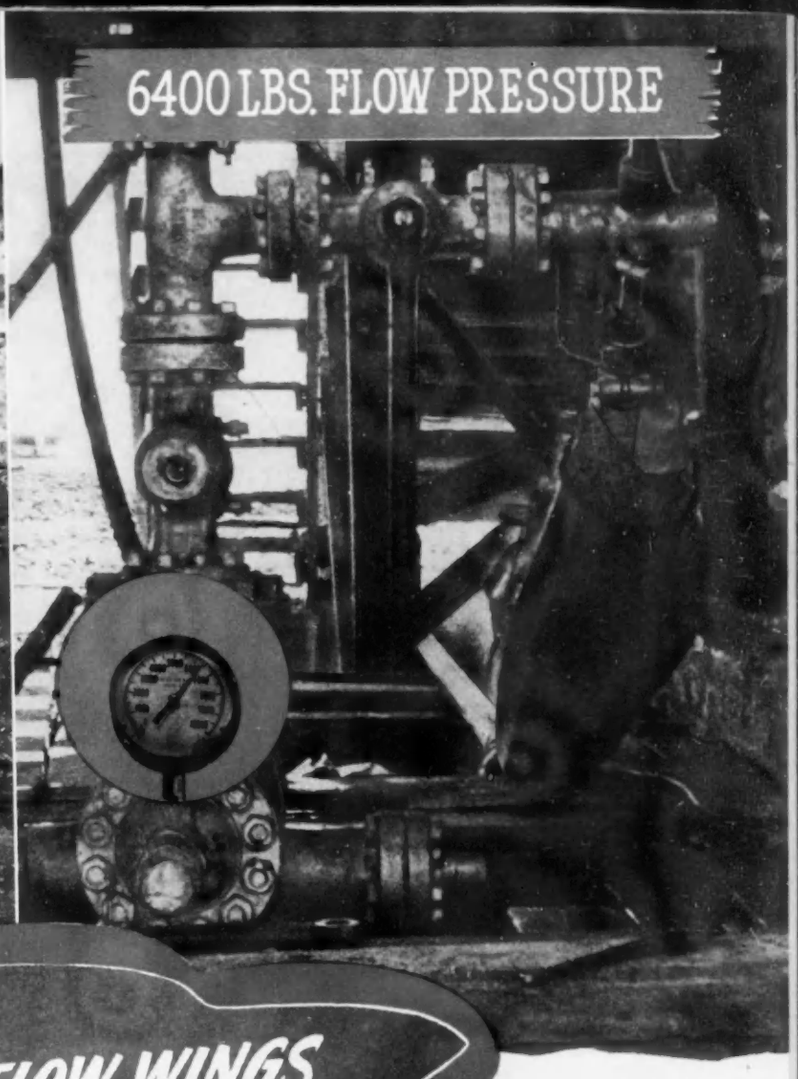
North Louisiana

Wildcats and Extension Tries Meet With Failure

Abandonment of three wildcats and three field outpost wells marked the development program in North Louisiana during the past week.

Tensas Parish: Sohio Producing Company abandoned Penro-Jordan 1, SE SW 8-11n-10e, 2 miles northeast of Holly





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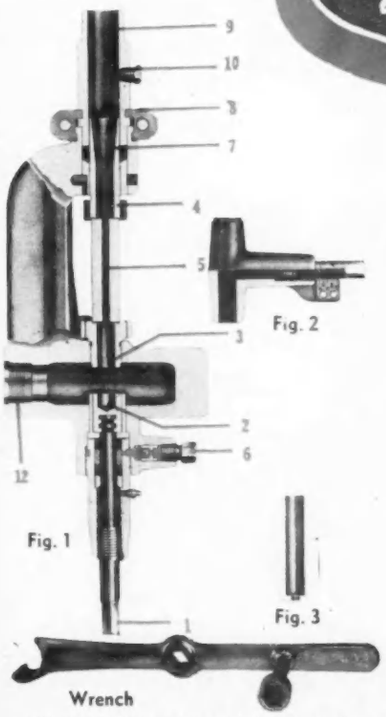

Fig. 1

Fig. 2

Fig. 3

Wrench

CROSS-SECTION VIEW OF A CAMERON TYPE "D" FLOW WING
(Patented)

The mechanical advantages, time-saving and economy features of Cameron Flow Wings are not limited to any given pressure service or to any make of Christmas tree. Like any other Christmas tree fitting, they may be incorporated in any manufacturer's surface control manifold. The above installation photographs illustrate the extreme pressure ranges in which Cameron Flow Wings are being used with complete satisfaction . . . in a simple, low pressure, screwed connection type manifold without conventional wing valves; and on the record high flow pressure well in a 10,000 lb. test all-flanged type manifold.

Operators who are not familiar with the mechanical design of Cameron Flow Wings are urged to study the cross-section view shown at left. Briefly, its operation is as follows: To change flow bean fit hexagon socket in wrench to valve stem (1) and close valve (2) against seat (3). Spanner part of wrench is then applied to clamp screw (4), and only two turns required to release flow bean (5). New bean is clamped in place by clamp screw and valve is then opened and well is back on production. Both valve stem and valve seat are faced with hard metal to resist cutting. Valve stem and bonnet are packed with plastic packing which may be replenished under pressure. Clamp screw is packed with an asbestos ring (7) which is tightened automatically as flow bean is clamped in place. Two-bolt union (8) obviates need for additional union in flow line. Note that downstream end of clamp screw is belled to reduce turbulence and cutting. Three types of flow beans are interchangeable: (1) "Proration" bean illustrated in flow wing; (2) adjustable flow bean, Figure 2; and (3) "production" type bean which consists of a body and renewable stellite orifice disc, Figure 3. All flow beans clamp in position as shown in Figure 1.

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Rocky Mountain: Mountain Sales & Service, Casper, Wyoming.

Ridge production, after testing dry in Tuscaloosa at 8479 feet.

Union Producing Company has set casing at 8415 feet at Penrod-Jordan 4, SE NW SW 20-11n-10e, east of production, after a favorable drill-stem test. Penrod-Jordan 3, SW SE 18-11n-10e, north offset to a producer, failed in the Massive sand but is drilling deeper at 9110 feet. The company is building roads for a seventh location in the area.

Claiborne Parish: Union Producing Company is rigging up at King Unit C-1, SE SE NE 17-21n-4w in the Lisbon area, and the company's Nolen 1, NW NW NE 9-21n-4w, which burned for 10 days after being completed, is being reworked.

Big West Drilling Company's outpost well, Rainach 1, 16-22n-5w, 4 miles northeast of production, which showed promise of a 4-mile north extension, is reported drilling below 8240 feet.

Hassie Hunt Trust's Mitcham 1, NW SW SW 3-21n-4w, after drilling to 7885 feet, perforated at upper levels to test at 5180-88 feet and 5194-5203 feet.

Arkansas

Adverse Weather Slows Operations in Fields

Following a week which reached a peak in the bringing in of new producers, came a week of heavy rain, delaying wells at the testing stage as well as drilling operations.

Only two completions were officially recorded: Lion Oil Refining Company's Whitlow 1, C S½ SE 21-18-21, in Columbia County, a dual completion making 144 barrels daily from lime and 30 barrels daily from Cotton Valley; and Curtis Kinard's Gaddy Estate 1, NW NE NE 14-17-14, in the Rainbow City field of Union County, flowing into pits with no gauge on production.

With clearing weather expected over the weekend, at least one well in Union County and several others in Columbia County are expected to be completed.

Rocky Mountain Area

Rangely Field to Get Second Deep Test

California Company et al are moving in material for a second test of the Weber sand of Pennsylvanian age, equivalent to the Tensleep sand in Wyoming, in the Rangely field, Colorado. The new well, Emerald 1, C NE SW 30-2n-102w, is located ¼ mile west of Raven 1, which was completed in 1933 as a flowing well for an initial production of 200 barrels of 33 gravity oil from Weber sand at 6335 feet after drilling to a depth of 7173 feet. The well was subsequently shut in but was put on production last September and has been producing approximately 200 barrels of 34.9 gravity oil daily, the oil being moved from the field by truck to Salt Lake City.

The Rangely structure, 10 miles east of the Utah boundary in the northwest corner of Rio Blanco County, is an anticlinal dome 12 miles long on the north flank of the Uinta mountains with the axis trending northwest to southeast and surrounded by an escarpment of lower Mesa Verde sandstone. Surface formation is Mancos shale and it has a known closure of 1200 feet.

The Rangely field was discovered in 1902 with a well producing 52 gravity oil from Mancos shale at 480 feet and at present the shallow output is running approximately 1000 barrels a day.

California Company is the principal owner of leases in the area. Stanolind Oil & Gas Company, successor to Midwest Refining Company has leased several thousand acres.

Gage Dome Test: Northern Ordnance Inc. is moving in material for Morris 1-B, C SE NW 14-9n-26e, on Gage dome in Musselshell county. Location is ½ mile west of Darr 1, which completed in the Amsden at 6125 feet for an initial production of 358 barrels of oil and extended the field 1½ miles to the northeast of the discovery.

Garland Tests: General Petroleum Corporation has spotted location for Well 2 in the northwest corner of Lot 53, Township 55n-97w, following discovery of oil in Howell 1, Lot 63-56n-97w, which swabbed 265 barrels of oil from the Tensleep sand at 4314-4436 feet. Ohio Oil Company has a new location in NW NW SW of Section 13-56n-98w, ¼ mile north of its Ohio-Kinney-Coastal Unit 5, NW SW SW 13-56n-198w, which swabbed 120 barrels of pipe-line oil from the Tensleep at 4349-4485 feet. The new location is approximately 100 feet lower on the structure. Pumping equipment is being installed for the new wells.

Michigan

New Pool Prospect Well Temporarily Abandoned

Stewart and Whites' Jorgensen 1, C NE NE 14-12n-6w, one of three new pool prospects developed in January, has been temporarily abandoned with the Montcalm County wildcat going dead after starting to make considerable water and little oil. Natural the well produced an average of 92 barrels of oil daily for five days from the Dundee at 3470-77 feet. It quit flowing and pump tests showed mostly water. Operators plan to leave the test idle until results on a west offset, already started, are determined.

Allegan County: Muskegon Development Company's Wilcox 1, SW SW NE 20-3n-13w, a mile south of a small Traverse pool in Monterey Township, earlier reported a failure, showed possible commercial pay in the Traverse when deepened to 1782 feet. Well swabbed from 10 to 20 barrels of oil and probably will be acidized.

State Conservation Commission on March 13 will hear an appeal by producers in the Reed City field against a proration order issued Dec. 16, 1943, by P. J. Hoffmaster, supervisor of wells. The order reduced the base allowable on 20-acre unit wells to 100 from 125 barrels per day after the State Advisory Board had voted to continue with the old program.

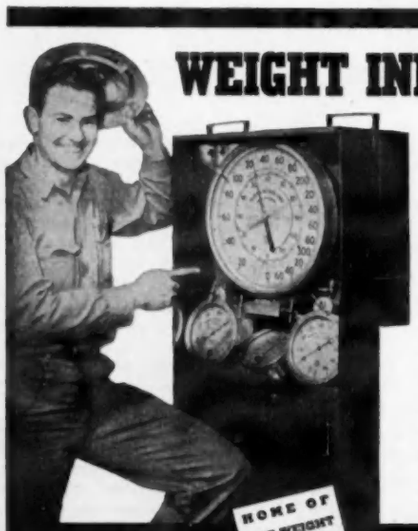
Bay Pipe Line Company of Saginaw after March 1 will buy crude on a 100 per cent strapping factor, less deductions for actual b.s.&w. It represents the first departure from the long-standing policy of 98 per cent strapping.

Producers recently renewed requests to pipe line companies for elimination of the 98 per cent strapping program, and the companies named a committee to work with producers but no buyers other than Bay indicated any immediate change. Whether the change could be made now under OPA regulations is questioned as division orders incorporate the 98 per cent factor for strapping, and the change to 100 per cent would in effect increase the price of oil, it was claimed.

The lands division of State Conservation Department will offer 58,000 acres at a two-day auction of leases on state lands for March 2 and 3.

☆

MAJOR WILLARD J. CLASSEN, Army Air Corps, has been placed on an inactive status and has returned to the oil industry after 20 months service, and will be chief geologist for Wilshire Oil Company, with headquarters at Bakersfield, California.



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California

Swing Toward Deeper Tests Seen in Permits

California wildcatting is developing a pronounced swing toward deep tests, many below 10,000 feet with a possibility that one or more of them may challenge the world's record for deep drilling held since 1938 by Continental Oil Company's 15,004-foot Wasco well.

At least six of the prospective deep shots will be put down in Los Angeles Basin, probably already the most intensively prospected district in the state. Santa Fe Springs and Long Beach, both tried before with unsatisfactory results, are in line for new ventures, either or both of which may pass 12,000 feet. In the Los Angeles metropolitan area, an Elysian Park test is scheduled to go to whatever depth the showings along the way appear to justify. Huntington Beach and Montebello fields also are slated for one deep exploration each this summer. In Baldwin Hills field one already nearly finished is now drilling below 11,400 feet.

The well most likely to go 15,000 feet or more is a test on the west side of Midway-Sunset field, Kern County. Earlier deep tests there developed data that indicate objectives sought hardly can be expected much above that level. This well is being drilled by Standard Oil Company, which now has seven California wells drilling below 10,000 feet.

Fresno County: In the Kerman area, 3 miles northwest of Raisin City field, Seaboard Oil Company and Tide Water Associated will explore holdings of several thousand acres, the first try in NW NW NW 28-14-17.

Kern County: Discovery of what appears to be a new shallow low-gravity oil field has been made in Kern Bluff area, to the northeast of Kern River field, by the second in a series of Standard Oil Company coreholes, in 21-29-29. Pump test made about 10 barrels daily rate of 13.5 gravity oil. A third corehole has been started in the center of 29-29-29, about ½ mile to the southwest.

Searching southeasterly along Spellacy anticline for a counterpart of its recently opened northwest extension of Republic sand production, Chanslor Canfield Midway Oil Co. is starting a wildcat in NW NE SE 20-32-23.

Los Angeles County: Loma Verde area in Castaic district, 5 miles north of Del Valle field, will be tested by a Shell Oil Company wildcat in SE NE SE 20-5-17. Shell and Continental Oil Company hold some 1200 acres of surrounding leases.

In Torrance field, Shasta Petroleum Company's March 1, made mostly water with only a little oil from a formerly unproduced zone at 3200 feet.

Puente Hills area, where lately several tests were unproductive, will be given another try, Allegheny Petroleum Corporation, announcing a wildcat in NE SE NW 14-2-10.

☆

A. R. DENISON, president of the American Association of Petroleum Geologists, gave an address on the subject "Present Status of Geologists," at a meeting of the Illinois Geological Society at Urbana.

That Report by Bernard Baruch

No choice between communism, socialism and free private enterprise has been announced by the White House. If the administration is willing, private capital and free enterprise can save the country from theorists and be ready with jobs when the war ends. Baruch has told us what to do. But who knows? And what point in knowing if we can't find out now? Snarled in red tape and smothered in taxes designed to bring about government ownership, business grimly remembers that in all history the preemptors have never willingly backed up. TRY PELCO FIRST for a taste of old-fashioned service founded before the New Deal dynasty and eager to survive. Then—try to visualize a supply and equipment service modeled by the experts who contrived your income tax forms.

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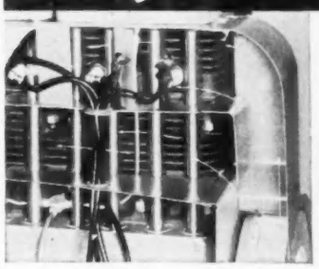

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United States Well Completions

ARKANSAS

Columbia County — Dorcheat - Macedonia: Phillips' Williamson & Phillips (Eva) 1, 598 s 1455 e of nw cor of n½ nw 19-18-21, 5½ 9013 ft, perf CV 6735-42, pump oil, 10% wtr, td 9031 ft.

Columbia County — Haynesville Extension: Mid-States Oil Corp.'s Taylor-Walker 1, 337 s 660 w of ne cor se 4-20-20, 992.40 bbls, 32/64-in, td 5537 ft.

Mid-States' S. J. Beene-Waller 1, 158 s 1880 e of nw cor sw 2-20-20, 1138.29 bbls, 32/64-in, td 5547 ft.

Columbia County—Macedonia: Lion Oil Ref. Co.'s J. H. Whitlow, 100 n of c s½ se 21-18-21, 5½ 8886 ft, dual comp, lime 6 bbls hr, 14/64-in, 16,820/1; CV 1¼ bbls hr, 9/64-in, 8700/1, td 8892 ft.

CALIFORNIA

Fresno County — Coalinga: Shell's 102-34, sw nw nw 34-19-15, pump 154 bbls oil, 40 wtr, 2400-50, 2384-21, 2304-2225, 2169-2026 ft, td 2465 ft.

Shell's 125-36, ne nw sw 26-19-15, pump 204 bbls, perf 2910-3886, 3834-17, 3776-05 ft, td 3915 ft.

Standard's 110-28A, nw se sw 28-19-15, pump 290 bbls 17-9-gr, 220 ft perf 3130 ft, "E" zone 2779 ft, "G" 2902 ft, td 3135 ft.

Standard's 71-1C, sw ne nw 1-20-15, pump 156 bbls 19.5-gr, 98 ft perf 3984 ft, "E" zone 3878 ft, "F" 3893 ft, "G" 3942 ft, "H" 4052 ft, td 4255 ft.

Texas Co.'s Calif-Coalinga 2, nw sw se 18-20-15, pump no est, 117 ft perf 2309 ft, td 2344 ft.

Fresno County — Coalinga, Eocene: Standard's 68-31B, sw sw se 31-19-16, flow 393 bbls 27.6-gr oil, 160,000 gas, 10/64-in, 800/850 lbs, 30 ft perf 8182 ft, EGA point 8154 ft, td 8183 ft.

Fresno County—Kettleman, North Dome: Kettleman No. Dome Ass'n's 67-34J, ne sw se 34-21-17, flow 1050 bbls 36.9-gr, 530,000 gas, 180/900 lbs, perf 8088-48, 8033-7970 ft, td 8114 ft.

Kern County — Belridge, South: Belridge Oil Co.'s 24-34, se sw nw 34-28-21, pump 35 bbls 14.9-gr, 10 wtr, 423 ft perf 870 ft, td 870 ft.

Belridge Oil Co.'s 24A-34, se sw nw 34-28-21, pump 35 bbls, 375 ft perf 800 ft, td 800 ft.

Belridge Oil Co.'s 33-34, nw se nw 34-28-21, pump 40 bbls 15.4-gr, 17 wtr, 620 ft perf 1160 ft, td 1180 ft.

Belridge Oil Co.'s 33A-34, nw se nw 34-28-21, pump 40 bbls 14-gr, 3 wtr, 548 ft perf 1010 ft, td 1010 ft.

General Pet. Corp.'s 83-2, ne nw se 2-29-21, pump 62 bbls 11.5-gr, 4 wtr, perf 571-665, 705-770, 875-909 ft, 1st oil sand 572 ft, td 918 ft.

General Pet. Corp.'s 47-2, ne ne se 2-29-21, pump 25 bbls 18.6-gr, 10 wtr, perf 604-619, 644-689, 909-964, 984-1005 ft, td 1021 ft.

Kern County — Edison: J. Paul Getty's Hoagland 1, nw nw ne 8-30-29, pump 93 bbls 16-gr, 15 wtr, 165 ft perf 4146 ft, td 4146 ft.

Tracy Harkness' Seale 2, sw nw nw 5-30-29, pump wtr w trace oil, 63 ft perf 4158 ft, td 4217 ft, pb and abnd 4158 ft.

Kern County — Fruitvale: Western Gulf's Neumann 1, nw sw se 21-29-27, pump 157 bbls 17-gr, 113 wtr, perf 4550-35, 4520-15, 4335-10, 4195-85, 4175-65, 4070-60, 4055-40, 4030-10, 3940-10, 3900-3870 ft, td 4623 ft.

Kern County—Kern Front: Richfield's Kern 3, nw ne ne 22-28-27, 96 bbls 25.5-gr, 30 wtr, 269 ft perf 2338 ft oil sand 2050 ft, td 2340 ft.

Standard's 4-3, sw ne nw 21-28-27, pump 118 bbls oil, 17 wtr, 90 ft perf 2890 ft, "M" 2352 ft, "N" 2665 ft, "P" 2670 ft, "Q" 2730 ft, "S" 2850 ft, td 2895 ft.

Standards 11-5-27, se se ne 27-28-27, pump 90 bbls 13-gr, 140 wtr, 255 ft perf 2475 ft, Chanac 2110 ft, td 2480 ft.

Kern County — Kern River: Tide Water's Chicago Crude 15, ne sw nw 30-28-28, pump 40 bbls 14-gr, 40 wtr, perf 874-1174 ft, td 1175 ft.

Kern County — Midway - Sunset: Chanslor Canfield Midway Oil Co.'s 2-2, nw ne ne 2-32-23, pump 75 bbls 14-gr, 90 ft perf 2670 ft, td 3513 ft, pb 2673 ft.

Chanslor Canfield Midway Oil Co.'s 68-9, ne se se 9-32-23, pump 18 bbls 16.5-gr, 12 wtr, 419 ft perf 2649 ft, td 2650 ft.

Otis Hoyt's Bronco 1, nw sw nw 8-11-23, pump 72 bbls 19-gr, 12 wtr, 60 ft perf 2415 ft, oil sand 2399-2404 ft, td 2728 ft, pb 2415 ft.

Murvale Oil Co.'s 48-20, se se sw 20-32-24, flow 368 bbls 24.5-gr, 147,000 gas, 10/64-in, 340/0 lbs, 229 ft perf 3396 ft, td 3401 ft.

Richfield's Calidon 9, ne sw sw 19-31-23, pump 10 bbls 20.2-gr, 4 wtr, 42 ft perf 2975 ft, td 3017 ft, pb 2977 ft.

Kern County — Mount Poso: Dwight G. Vedder's 2-18, nw nw se 18-27-28, pump no est, 45 ft perf 2508 ft, td 2557 ft, pb 2508 ft.

Kern County—Poso Creek: Butler Bros.' 1, nw nw nw 14-27-27, pump 50 bbls 12-gr, 5 wtr, perf 1197-1245 ft, td 1293 ft.

Kern County—Round Mountain: Crestmont Oil Co.'s Staley 16, sw ne se 8-28-29, pump 60 bbls 17-gr, 25 wtr, perf 1636-23, 1587-77, 1530-15, td 1678 ft.

Dwight G. Vedder's Bell 16, se sw ne 12-28-28, pump 25 bbls 15.7-gr, 25 wtr, 29 ft perf 1754 ft, td 1754 ft.

Los Angeles County — Newhall - Potrero: General Exploration Co.'s Ferguson 2, se nw se 36-4-17, flow 475 bbls 34.5-gr, 30/64-in, 150/600 lbs, 279 ft perf 7112 ft, 2nd zone 6820 ft, oil sand 5820-30, td 7114 ft.

Thos. Kelly & Sons' McMillan Comm 1, (owdd) 155 ft s 130 ft e c/l Ball Road and Compton, flow est 125 bbls, 268 ft perf 8037 ft, otd 7693 ft, redr 8097 ft, pb 8038 ft.

Los Angeles County—Wilmington: Cecil B. DeMille Productions' DeMille-United 3, 150 ft n 104 ft w c/l McDonald and Lomita Blvd, pump 70 bbls 16-gr, perf 3298-3378, 3455-3542, td 3542 ft, pb 3480 ft.

Orange County—Huntington Beach: Standard's B-76, 750 ft nwly on c/l Ocean fr c/l 23rd Ave and 745 ft nely at r/a, flow 90 bbls 15.3-gr, 14 wtr, 24/64-in, 50/960 lbs, perf 3436-2621, 2576-2517 ft, td 3500 ft.

Santa Barbara County — Lompoc: Union's Purisima (owdd) 10, 35-8-34, pump 168 bbls 19.2-gr, 102 wtr, 321 ft perf 2755 ft, otd 2557 ft, td 2755 ft.

Santa Barbara County—Santa Maria Valley: Union's F. Vicente 9, 330 ft s 330 ft e nwc Vicente lse, flow 587 bbls 15.1-gr, 215 wtr, 26/64-in, 588 ft perf 5063 ft, td 5064 ft.

Union's O'Donnell 2-6, 1150 ft sly 330 ft wly fr nec O'Donnell 2 lse, pump 449 bbls 13-gr, 240 wtr, 719 ft perf 5360 ft, td 5361 ft.

Solano County—Rio Vista: Amerada's J. Mayhood 2, se ne nw 2-3-2, flow 5,848,000 gas, 5/8-in, 728/1249 lbs, 126 ft perf 4439 ft, td 4439 ft.

Ventura County — Rincon: General Pet. Corp.'s Ferguson 17, 1670 ft swly on wly 1 Ferguson Permit 48 fr nwc then 134 ft sly at r/a, flow 218 bbls 30.3-gr, perf 2544-74 ft, td 2575 ft.

Ventura County—Sespe Canyon: Merchants Pet. Co.'s Cochran 7, (owdd) 100 ft n on No. 5, 1-4-20, pump 180 bbls 17-gr, 120 wtr, otd 952 ft, td 1768 ft.

Ventura County — Ventura Avenue: Shell's Taylor 171, 1347 ft s 12,661 ft w R. C. L. 11, flow 720 bbls, perf 7617-7333, 7290-7120, 7079-6741, 6698-6501 ft, td 7620 ft.

CALIFORNIA WILDCATS

Glenn County—Discovery: Richfield's Afton Comm. 1-1, ne se se 34-19-1, Chico area, flow 4,000,000-6,000,000 gas, 20-42/64-in, perf 2468-60 ft, td 5242 ft, pb 3190 ft.

Kern County — Failures: E. A. Bender's Orloff 1, nw nw sw 6-29-28, Kern River area, abnd 1922 ft.

Seaboard Oil Co.'s Fuhrman 2, ne se ne 21-28-28, Kern River area, gray sand, abnd 3328 ft.

Western Gulf's Richgrove Comm. 1, nw sw se 4-25-27, Richgrove area, topped Granite 2947 ft, abnd 2954 ft.

Kern County—Discovery: Union's Richardson 53-18, nw sw sw 18-29-21, Gould Hills area, pump 5 bbls oil, 175 wtr, 21 ft perf 1353 ft, brown shale 896 ft, td 3987 ft, pb 1353 ft.

Tulare County—Failure: Continental Dev. Corp.'s Corehole 1-11-2, ne ne ne 11-23-27, green wtr sd, abnd 779 ft.

ILLINOIS

Clay County: Shell's L. Moss 6, ne sw sw 14-5n-5e, AV 2330-41 ft, 26 bbls, 2341 ft.

Carter's Vangeison 4, se ne se 15-5n-5e, Cyp 2124-28½, Ben 2280-83 ft, AV 2326-2334 ft, 198 bbls, 2314 ft.

Cumberland County: Forest Oil Corp.'s I. Hayworth E-5, se sw se 12-10n-10e, Casey 297-346 ft, 15 bbls, 359 ft.

Franklin County: E. S. Adkins' C. E. Dawson 1, se ne sw 25-7s-2e, abnd 2894 ft.

Hamilton County: Shell's A. Ray 1, nw se sw 5-6s-7e, abnd 3048 ft.

Jefferson County: Bell Brothers' Indiana Nat'l. Bank "B" 1 (WO), e½ sw ne 24-1e-3e, L O'H 2726-36 ft, 55 bbls, 2880 ft.

Madison County: C. H. Parriott & Phoebes Bros.' Gray-Lahr-Shaw Comm. 2, sw sw sw 18-4n-10w, Bridge 792-800 ft, 1,250,000 gas, 800 ft.

Oberling & Bryant's H. Buckman 3, ne nw se 27-3n-6w, Trenton 2315-35 ft, 3 bbls, 2335 ft.

St. Clair County: R. F. Loveridge's Gaskill 5, s½ nw nw 34-1n-10w, Trenton 654-88 ft, 7 bbls, 690 ft.

R. F. Loveridge's Gaskill 4, se nw nw 34-1n-10w, Trenton 634-72 ft, 70 bbls, 672 ft.

Vanderburg County: Sinclair - Wyoming's Beottecher 5, sw ne sw 19-7e-11e, comp as SWDW, abnd 2459 ft.

Wabash County: Superior's L. Lippper 2, se ne sw 28-1s-14w, Ben 2778-90 ft, 170 bbls, 2948 ft.

Dean & Morton et al's H. Baumgart 2-A, nw se sw 5-1s-12w, TS 1678-87 ft, Cyp 1989-2006 ft, 378 bbls, 2008 ft.

Texas' R. Stein 6, sw nw ne 8-1s-12w, Cyp 2042-52 ft, 98 bbls, 2054 ft.

Bennett Bros.' C. E. Harris 1, nw sw sw

Wells Completed in United States in Week Ended February 26, 1944

Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second issue of each month. More detailed data on wildcats published in third issue of each month.

State or District	FIELD COMPLETIONS: New Wells *Oil	Gas	†In-put	Dry	Total	Old Wells Deep-ened	WILDCAT COMPLETIONS *Oil	Gas	Dry	Total	ALL COMPLETIONS This Week	Last Week	Cumulative This Year	Cumulative Last Year
Arizona													1	
Arkansas	7				7						7	1	24	26
California	35	1		1	37	3	1	1	4	6	46	35	252	169
Colorado												2	4	5
Georgia														1
Illinois	31	1	1	6	39				11	11	50		267	290
Indiana	9			1	10		1		3	4	14		48	43
Iowa														2
Kansas	15			8	23		1		15	16	39	13	277	220
Kentucky	4			2	6		1		6	7	13		66	34
Louisiana	6			6	12				5	5	17	16	90	87
North Louisiana	1			3	4				3	3	7	7	30	37
South Louisiana	5			3	8				2	2	10	9	60	50
Michigan	3			2	5				7	7	12	20	94	85
Mississippi													3	11
Missouri													2	2
Montana	2				2		1			1	3	13	43	36
Nebraska													7	12
New Mexico	2	2		2	6				1	1	7	6	59	41
New York	15		10		25						25	25	172	182
Ohio	2	2		1	5						5	17	74	137
Oklahoma	21	1		6	28		1	2	3	6	34	32	226	201
Pennsylvania	28	4	14	1	47						47	44	347	383
Tennessee													1	1
Texas	55	2		12	69	2	8		15	23	94	93	717	
E.Tex.Bor. Co.'s												3	4	2
E. Texas Field														2
Rest of E. Texas	4				4				3	3	7	1	40	35
North Texas	8	1		3	12		2		2	4	16	22	158	133
W. Central Tex.	3			2	5	1			2	2	8	6	52	50
West Texas	20				20	1	1		1	2	23	27	180	124
Tex. Panhandle	2			1	3						3	4	24	46
G. Coast, Upper	6			3	9				5	5	14	14	75	36
G. Coast, Lower	12	1		2	15		4			4	19	10	126	79
Southwest Texas				1	1				1	1	2	4	46	58
S. Central Tex.							1		1	2	2	2	12	13
West Virginia	1	15			16						16	15	137	99
Wyoming	1				1						1	7	23	26
Total U.S.	237	28	25	48	338	5	14	3	70	87	430	339	2,934	2,651

* Includes distillate wells. † Includes salt water disposal wells.

16-1s-12w, Biehl 1445-80 ft, 5 bbls, 2349 ft.

Wayne County: Deep Rock's O. W. Harper 1, se ne 32-1s-7e, L O'H 3239-44 ft, McCl 3289-97 ft, 88 bbls, 3297 ft.

Texas Co.'s Finley 1, ne sw 32-1s-7e, L O'H 3216-20 ft, McCl 3268-75 ft, 108 bbls, 3277 ft.

Pure's Watson Cons. 1, se se 22-1s-8e, abnd 3330 ft.

Texas Co.'s J. M. Harris 3, ne nw nw 4-3s-7e, AV 3207-19 ft, 13 bbls, 3219 ft.

White County: C. E. Brehm's Boltinghouse 1, sw nw nw 19-4s-14w, McCl 3096-3109 ft, 85 bbls, 3109 ft.

Seaboard & Sohio's G. D. & M. M. York 1, se ne nw 28-6s-10e, TS 2271-78 ft, 2281-86 ft, 54 bbls, 2288 ft.

Edwards County: G. H. Schrock's Scott Heirs 1, sw se ne 36-2s-10e, Biehl 2059-69 ft, 114 bbls, 2626 ft.

Tide Water's N. R. Van Schoick 1, nw ne nw 18-1n-10e, AV 3142-58 ft, 7 bbls, 3160 ft.

Ford County: Herndon Drlg.'s W. J. Fecht 1, se se sw 33-26n-9e, abnd 2237 ft.

Gibson County: Sohio's M. Kerwin 8-X, nw sw nw 14-3s-14w, abnd 2796 ft.

C. R. Ross' A. Akin 4, 950 ft sl 2760 el nw 7-3s-13w, abnd 2530 ft.

Hamilton County: Shell's C. Hawthorne 1, ne se se 27-4s-7e, AV 3310-19 ft, 10 bbls, 3327 ft.

Texas Co.'s H. Wheeler 1, ne se nw 19-6s-7e, Cyp 2756-88 ft, 3 bbls, 3099 ft.

Madison County: L. A. Oberling et al's Becker Pence Comm. 2, se ne se 9-4n-6w, Dev 1688-93 ft, 236 bbls, 1695 ft.

Marion County: Texas' Co.'s Snyder Comm. 1, se sw se 9-1n-2e, Ben 1892-1900 ft, 55 bbls, 1900 ft.

Wabash County: Texas Co.'s R. Stein 7, se sw 5-1s-12w, TS 1696-1712 ft, 92 bbls, 2057 ft.

Texas Co.'s W. Steckler, se ne sw 8-1s-12w, Penn 1508-25 ft, 60 bbls, 2042 ft.

Wayne County: Pure's T. H. Markham, nw sw 9-1s-6e, McCl 3156-62 ft, 104 bbls, 3174 ft.

Buren & McGregor's Fee 3, se se 32-1s-7e, McCl 3272-76 ft, 120 bbls, 3277 ft.

Cities Service's Boggs "C" 1, nw sw sw 33-2s-9e, Rosi 3255-60 ft, 36 bbls, 3370 ft.

Pure's G. H. Bissey "B" 1, se nw sw 25-2n-7e, AV 2905-21 ft, 134 bbls, 2940 ft.

Pure's Earl Flexter 3, se se sw 34-2n-7e, AV 2980-3001 ft, 288 bbls, 3045 ft.

Pure's W. L. Waller 1, se sw se 34-2n-7e, AV 2975-90 ft, 23 bbls, 3000 ft.

White County: Carter's A. A. Miller 1, nw ne ne 28-6s-10e, TS 2261-70 ft, 2272-74 ft, 480 bbls, 2275 ft.

ILLINOIS WILDCATS

Alexander County—Failure: Whitebread & Kippings' R. W. Minton 2, sw se 3-15s-3w, abnd 342 ft.

Lawrence County—Failures: O. Fevezanetis et al's Chistakis Bros. 1, ne se se 28-3n-12w, abnd 2300 ft.

Clark C. Nye's Crane 1, nw nw nw 33-3n-12w, abnd 2215 ft.

Washington County — Failure: E. J. Ruwaldt's F. Brinkman 1, nw ne sw 14-2s-9e, abnd 2475 ft.

White County—Failure: E. J. Kubat's Strum 1, n½ ne ne 14-4s-10e, abnd 3220 ft.

Clinton County—Failure: Stanolind's C. D. Phillips 1, nw nw nw 4-2n-3w, abnd 2513 ft.

Edwards County—Failure: Big Chief Drlg. et al's Clayton Bunting 1-A, sw se se 29-1s-10e, abnd 3526 ft.

Hamilton County — Failure: Sur-Kan Pet. Co.'s C. W. Wheeler 1, n½ se ne 33-5s-7e, abnd 3484 ft.

Jasper County—Failure: Continental's A. L. Blair 1, se ne ne 9-5n-9e, abnd 3103 ft.

Marion County—Failure: Absher & Booth's L. J. Jones 1, nw ne se 10-3n-2e, abnd 2372 ft.

Washington County — Failure: Harry H. Hubbard's Sandheimrich 1, sw sw sw 18-2s-5w, abnd 955 ft.

INDIANA

Gibson County: Superior's E. Thompson 2, se ne ne 25-2s-12w, Cyp 1969-83 ft, 1 bbl, 1985 ft.

Superior's C. W. Yeager Unit 2, se se ne 25-2s-12w, Cyp 1975-85 ft, 38 bbls, 1985 ft.

Jasper County: Carter's Theobold 1, ne ne nw 22-8s-15w, Walt 1953-68 ft, 168 bbls, 1974 ft.

Wabash County: George & Wrather's G. B. Wilson 3, se ne sw 4-1s-12w, McCl 2303-09 ft, 2314-17 ft, 384 bbls, 2317 ft.

Gibson County: Chester Oil's Geo. Shoultz 5, ne se se 17-1s-9w, Hds 1285-1308 ft, 40 bbls, 1308 ft.

Superior's Permelia Massey Unit 1, nw nw se 25-2s-12w, Cyp 2035-46 ft, 70 bbls, 2046 ft.

Superior's F. Mounts Unit 1, nw ne se 25-2s-12w, Cyp 1983-95 ft, 5 bbls, 1995 ft.

Superior's L. Steward 1, nw sw se 25-2s-12w, abnd 2451 ft.

Superior's Eugene Thompson 1, se nw ne 25-2s-12w, Cyp 1961-70 ft, 45 bbls, 1974 ft.

Continental's Bozeman Land Co. 68, se nw sw 24-3s-5w, Walt 2073-90 ft, 58 bbls, 2100 ft.

INDIANA WILDCATS

Gibson County — Discovery: Superior's E. Thompson 3, nw ne ne 25-2s-12w, Ben 2102-09 ft, 12 bbls, 2341 ft.

Greene County — Failure: C. V. Guthrie's Chris Smith 1, 3700 sl 900 ft el 32-6s-5w, abnd 1210 ft.

Sullivan County — Failure: Farm Bureau Oil Co.'s A. N. Taylor 1, c nw nw 8-9n-9w, abnd 2480 ft.

Sullivan County—Failure: Ryan Oil's Barrett 1, c se ne 1-7s-10w, abnd 2357 ft.

KANSAS

Barton County — Boyd Pool: Continental-Phillips' C. Frieb 1, se se nw 4-18s-14w, Arbuckle 3438 ft, 1109 bbls, swab 114 bbls oil 3 hrs, 3450 ft.

Butler County—Eldorado: Magnolia's Koopler 69, c n¼ sw ne 30-26s-5e, Wilcox 3122 ft, 500 gals acid, 30 bbls oil, 2666 ft.

Butler County—Weaver Pool: Walnut Oil's Covert 1, sw nw sw 36-27s-5e, Wilcox 3122 ft, abnd 3153 ft.

Butler County—Couch Pool: National Ref.'s Sandstrum 1, ne ne se 14-30s-5e, Chat 2893 ft, td 2900 ft.

Cowley County: Northern Ord.'s Bailey 1, nw sw se 8-33s-5e, Lansing 2400 ft, shot 5 qts 2399-2406 ft, bail 2 bbls wtr hr, td 3510 ft, pb and abnd 2392 ft.

Ben Grallop et al's Collier 1, se se sw 14-34s-5e, B'ville 3007 ft, est 2,000,000 gas, pump & flow 100 bbls oil, 3030 ft.

Cowley County—Hahn: B. B. Blair & McMahon's Waldschmidt 3, nw se se 12-34s-5e, B'ville 2879 ft, 248 bbls, 2915 ft.

Ellsworth County—Wilkins: C. E. Ash's Wilkens "A," c n½ ne nw 13-17s-10w, Arbuckle 3270 ft, abnd 3290 ft.

McPherson County—Lindsborg: Ring-Mac's Spongberg 1, c w½ nw nw 30-17s-3w, Viola 3370 ft, 1000 gals acid, 300 bbls, 3377½ ft.

Texas Co.'s Tolle 3, c w½ nw se 16-17s-1w, abnd in Miss 2570 ft.

McPherson County—Paden: Phillips' Tecter 1, sw se nw 10-18s-1w, Miss 2677 ft, 217 bbls, 2691 ft.

McPherson County: Adair Marton - Phillhan's Bishop 1, sw nw ne 15-18s-1w, Viola 3264 ft, abnd 3270 ft.

Pratt County—Carmi: Champlin's Miskiman 1, c nw se 32-26s-12w, Arbuckle 4269 ft, 16,300 gals acid, 100 bbls, 4299 ft.

Pratt County — Chitwood: Cities Service's Barker 2, sw nw se 23-28s-12w, Simpson 4394 ft, 1000 gals acid, oil no est, 22 bbls wtr, 4520 ft.

Reno County—Burton: E. B. Shawer's Borndrager 1, se se ne 23-24s-5w, Miss 3330-35 ft, 1000 gals acid, swab 2 bbls fluid per hr, 25% oil, 75% wtr, 3400 ft.

Reno County—Zenith: Texas' Hornbaker 4, c w½ sw se 32-23s-10w, pump 1679 bbls, Viola, 3696 ft.

Russell County — N. W. Gustason: Cities Service's Zeman "B" c s½ se se 9-15s-12w, Arbuckle 3241 ft, 108 bbls oil, 3245 ft.

Russell County — Trapp: Auto Ordnance-Virginia Drlg.'s Martha Strecker 1, c s½ nw se 16-15s-14w, Arbuckle 3260 ft, abnd 3311 ft.

Stafford County—Farmington: Skelly's West Campbell 1, sw nw se 34-24s-15w, Arbuckle 4399 ft, 1500 gals acid, 1288 bbls oil, 4424 ft.

Stafford County — Drach: Stanolind's H. Tiepermann 2, c s½ sw se 6-22s-12w, Arbuckle 3668-74 ft, 3000 gals acid, pump 167 bbls oil, 15% wtr, 3674 ft.

Sumner County—Zyba: Richmond & Reigle's Farney 1, Simpson 3847 ft, pump 450-500 bbls, 3856 ft.

Trego County—Ellis: Stanolind's Cromb 2, c w½ nw ne 1-13s-21w, Arbuckle 3821 ft, 2000 gals acid, 120 bbls oil, 2% wtr, 3848 ft.

Woodson County—Big Sandy: Havlic et al's Fagan 1, se sw sw 11-26s-14e, Miss 1490 ft, 1518 ft.

KANSAS WILDCATS

Barber County—Failure: Great Lakes Carbon's Gillespie 1, se sw ne 15-32s-12w, Miss 4349 ft, abnd 4879 ft.

Barton County—Failure: Stanolind's M. P. Schaul 1, c w½ ne nw 1-16s-12w, Anhy 740 ft, Lans 3020 ft, abnd 3366 ft.

Butler County — Failures: Zephyr Drlg.'s Phillips 1, ne ne nw 20-29s-5e, KC 2235 ft, Miss 2865 ft, abnd 2871 ft.

T. Jeff Archer's Branine 1, c ne nw 19-27s-4w, Viola 4075 ft, soft 4076-78½ ft, Simp 4096 ft, abnd 4107 ft.

Cowley County — Failures: Northern Ordnance's Bailey 1, nw sw se 8-33s-5e, base Miss 3450 ft, td 3598 ft, pb and abnd 2392 ft.

E. F. Wakefield & Continental's C. E. Martin 1, nw se nw 12-32s-3e, Base Miss 3290 ft, Simp 3358 ft, Arb 3366 ft, abnd 3380 ft.

Dickinson County—Failure: Transwestern's Leonard Meuli 1, sw c 1-15s-2e, lime 2474 ft, abnd 2476 ft.

Ellsworth County — Failure: Bridgeport's Larson "C" 1, nw c ne 26-17s-6w, Misener 3526 ft, Hunton 3529 ft, Maquoketa 3528 ft, Viola Simp 3646 ft, Arb 3710 ft, abnd 3740 ft.

Pawnee County — Discovery: Champlin's Marcotte 1, se ne sw 15-10s-20w, Arb 3753 ft, 250 gals acid, swab 75 bbls 2nd hr, 1400 ft.

Saline County — Failures: Harbar-Sinclair Prairie's Latten 1, c s½ nw ne 35-14s-1w, Burgess 2554 ft, 2568-73 ft shale break, abnd 2715 ft.

Anderson-Prichard's Damoude 1, nwc ne 27-15s-1w, Miss 2572 ft, Kind 2798 ft, Hunton 2916 ft, Sylvan 3063 ft, Viola 3168 ft, abnd 3187 ft.

Rush County—Failure: Royer, Farris & El Dorado Refg.'s Urban 1, ne c sw 16-16s-17w, Arb 3553 ft, abnd 3585 ft.

Sedgwick County—Failures: H. A. Hershfield & Co.'s Gsell 1, c nw nw 34-26s-1w, Lans 2527 ft, Viola 3328 ft, Simp 3356 ft, Pre-Cambrian 3491 ft, abnd 3501½ ft.

Barnsdall's Christine Nelson 1, 17-29s-3e, se nw nw, Miss 3120 ft, Simp 3488 ft, Arb 3507 ft., abnd 3560 ft.

Stafford County—Failure: H. A. Hershfield & Co.'s W. M. Waite 1, c nw sw 25-22s-12w, Arb 3686 ft, Simp 3615 ft, abnd 3691 ft.

Woodson County—Failure: Havlic et al's Fegan 1, se sw sw 11-26s-14e, lime 1247 ft, Peru 970 ft, Miss 1490 ft, abnd 1518 ft.

KENTUCKY

Butler County: L. B. Green's Ed Sumner 4, 13-H-32, Hds 367-87 ft, 10 bbls, 388 ft.

Daviess County: A. H. Crohn et al's Ida Boles 1 (2), 18-N-31, abnd 757 ft.

Henderson County: Carter's S. Yunkers 1, 25-P-21, abnd 2732 ft.

W. F. Lacey et al's Woods 5, 16-Q-22, TS 1864-72 ft, 75 bbls, 1872 ft.

Woods et al's Bauldauff 5, 16-Q-22, TS 1858-68 ft, 50 bbls 1871 ft.

Union County: Hiawatha Oil's City of Uniontown 8, 20-P-19, Cyp 2167-80 ft, 195 bbls, 2194 ft.

KENTUCKY WILDCATS

Daviess County—Failure: Vickers & Slaghter's Curz 1, 12-P-28, abnd 1920 ft.

Henderson County—Failures: Carter's P. B. Waller 1, 15-O-22, abnd 2774 ft.

Great Lakes Carbon's O. W. Rash Heirs 1, 6-P-27, abnd 2009 ft.

Hancock County — Failure: Ky. Nat. Gas Co.'s R. Gist 1, 17-P-33, abnd 799 ft.

Henderson County—Discovery: Woods et al's Bauldauff 6, 16-Q-22, Cyp 2252-65 ft, 50 bbls, 2265 ft.

Hopkins County—Failures: H. C. Deitrich's Gooch 1, 6-K-23, abnd 2050 ft.

Kingwood Oil Co.'s W. L. Coffman 1, 11-K-26, abnd 2721 ft.

NORTH LOUISIANA

Concordia Parish—Lake S. John: California Co.'s Beasley 1, 8-9n-10e, abnd 4578 ft.

De Soto Parish — Kingston - Holly: Texas Mineral Land's Lee 1, nw nw sw 33-14n-13w, Woodbine perf 2798-813 ft, pump 24 bbls, td 2813 ft.

La Salle Parish — Nebo Hemphill: B. E. Davis' Jones 3, 41-7n-3e, abnd 4302 ft.

Webster Parish — Shungaloo: Navarro's Mitchell 1, nw ne sw 31-23n-9w, abnd 3010 ft.

NORTH LOUISIANA WILDCATS

Madison Parish—Failure: C. R. Murphy's Sonderheim 1, 10-17n-12e, abnd 4470 ft.

De Soto Parish—Failure: Superior's Mansfield 1, ne nw 24-11n-11w, ns, abnd 6508 ft.

Tensas Parish—Failure: Sohio Prod. Co.'s Penrod-Jordan 1, se sw 8-11-10, abnd 8497 ft.

SOUTH LOUISIANA

Ascension Parish—St. Gabriel: Denman Lbr. Co.'s Natalbany Lbr. Co. 1, 660 n&w of se cor ne sw 8-9s-2e, td 9960 ft, pb and abnd 9958 ft.

Beauregard Parish—Neale: Atlantic's W. Stutesman 1, 1995 e 660 s of nw cor 36-3s-11w, elev 192 df, sd 10,160-72 ft, 5½ 11,820 ft, perf 36 shots 10,160-66 ft, pump 454 bbls 49.2-gr, ¼-in, 1550/1, td 10,822 ft.

LaFourche Parish—Delta Farms: Humble's Hopkins 2, start ne cor sec 1 go wly alg nl 3261.5 ft th sly parallel to el 1980 to lcn 1-17s-22e, perf 69 shots 9037-53 ft, pump 120 bbls 34.5-gr, ¼-in, td 9061 ft.

Plaquemines Parish—Garden Island: Texas Co.'s State-Garden Island 64, s 65° 37 mins w 9273 fr USCGS Mon. Minnesota 109-23s-32e, top salt 6646 ft, perf 4225-49 ft, pump 90 bbls 25.8-gr, ⅛-in, td 6654 ft.

St. Mary Parish—Belle Island: Sun's Belle Island Corp. 4, 1012 s 456 w of ne cor 2-18s-10e, shale and sd, jkd and abnd 10,703 ft.

Terrebonne Parish—South Houma: Humble's LaTerre Co. C-1 (B-2), start ne cor sec 81 go sly alg el 2189.4 th wly at ra 3401.6 to lcn 81-18s-18e, sdy sh, abnd 10,175 ft.

Terrebone Parish — Callou Island: Texas Co.'s State-Terrebonne Bay 9, 7766 n 24° 50 mins e fr USCGS Mon. Lou T-23s-19e, perf 6655-86 ft, pump 43 bbls 40.3-gr, 9/64-in, 5000/1, td 7649 ft.

Vermillion Parish—Gueydan: Pure's Alliance Tr. Co. 15, 2940 fr sl 2259 fr el 33-11s-1w, 5½ 10,066 ft, perf 140 shots 9668-96 ft, pump 254 bbls 35.8-gr oil, 182,000 gas, 9/64-in, td 10,066 ft.

SOUTH LOUISIANA WILDCATS

Tangipahoa Parish—Failure: Humble's Jos. Rathborne Ld. Co. 1, start se cor sec 25 go nly on el 2020.7 th wly at ra 660 to lcn 25-7s-7e, abnd 9314 ft.

Vermillion Parish — Failure: Phillips-Tide Water's Godchaux 1, start ne cor sec 88 go swly alg sel 650 th w at ra 990 in 88-14s-3e, abnd 12,526 ft.

UNITED STATES WELL COMPLETIONS

MICHIGAN

Allegan County—Trowbridge: F. T. Cannon's Woodhams 1, sw se ne 31-1n-13w, Traverse, abnd 1328 ft.

Bay County—Kawkawlin: Gulf's Knochel 1, s½ ne nw 35-15n-4e, Dundee, pump & flow 55 bbls, td 2924 ft.

Swantek-Schultz 1, s½ se sw 35-15n-4e, Dundee, flow 60 bbls, td 2918 ft.

Clare County—Hatton: Freeman Oil Co.'s Citizens Bank 2, se sw ne 31-18n-4w, Dundee, flow 320 bbls 7 hrs, td 3919 ft.

Mecosta County—Fork: Smith Pet. Co.'s Carpenter 3, s½ se sw 6-16n-7w, Dundee, flow 313 bbls 14½ hrs, td 3817 ft.

Van Buren County—Columbia: Millers Bros.' Landrus 2, sw sw nw 11-1s-15w, Traverse, abnd 3235 ft.

MICHIGAN WILDCATS

Barry County — Failure: R. E. Shaffer's Payne 1, se nw nw 27-2n-9w, Traverse, td 1915 ft.

Gratiot County—Failure: Weller and Caldwells' Davidson 2, ne nw sw 36-11n-3w, Dundee 3180 ft, so 3202 ft, wtr 3225 ft, abnd 3235 ft.

Iosco County — Failure: Stork Oil Co.'s Gypsum Co. 1, n½ ne nw 16-21n-6e, Dundee 3079 ft, abnd 3302 ft.

Missaukee County—Failure: E. V. Hilliard's Woods 1, sw sw sw 14-22n-7w, Dundee 3900 ft, abnd 4115 ft.

Newaygo County—Failures: W. A. Firth's Miller 1, sw se nw 9-13n-11w, Monroe 3278 ft, abnd 3380 ft.

Sun's Schmidt 1, s½ se se 1-14n-13w, Traverse 2542 ft, abnd 3165 ft.

Osceola County—Failure: Sun's Davy D1, s½ sw se 36-17n-8w, Dundee 3880 ft, abnd 4093 ft.

MONTANA

Glacier County — Cut Bank: E. L. Cobb's Tribal 1, Contr. 4, se se nw 34-32n-6w, swab 363 bbls Cut Bank sand 3075-3116 ft, 7-in 3050 ft, td 3120 ft.

Toole County — Kevin - Sunburst: Ogden-Kevin Oil Co.'s Zacher 8, ne sw nw 20-35n-1w, 500 gals acid, pump 60 bbls Ellis-Madison 1570 ft, td 1576 ft.

MONTANA WILDCAT

Musselshell County—Gage Dome: Northern Ordnance's Darr 1, c se ne 14-9n-26e, flow 358 bbls Amsden 6087 ft, td 6125 ft.

NEW MEXICO

Eddy County: Kenwood Oil Co.'s Ginsberg 2-B, c ne sw 17-18s-31e, abnd 3530 ft.

Malco Refineries' State 1-D, ne se nw 2-18s-27e, pump 6 bbls, 500 gals acid 408-1440 ft.

Texas Trading Co.'s Johnson 1, c nw nw 33-16s-31e, flow 200 bbls, 2-in, 3389-3470 ft.

Lea County—Maljamar: Lion's Wyatt 1, c ne nw 31-17s-33e, elev 4002 ft, abnd 4413 ft.

Lea County—Rhodes: Krupp-Flaherty Oil Co.'s Moberly 7-B, c se ne 20-26s-37e, flow 40 bbls, 2-in, shot 40 qts 3165-3280 ft, td 3297 ft.

San Juan County—Rattlesnake: Continental-Santa Fe Corp.'s Munoz-Rattlesnake 111, 1650 ft snl 1320 ft wel 2-29n-19w, elev 5279 ft, 150,000 ft gas, sand 720-25 ft.

San Juan County — Barker Creek Dome: Southern Union Prod. Co.'s Ute Indian-Barker Creek 6, c se sw 10-32n-14w, elev 7491 ft, 4,000,000 gas, sd 3153-3252 ft, td 3277 ft.

NEW MEXICO WILDCAT

San Juan County—Failure: G. H. Tolcott et al's Tolcott 1, se nw sw 25-30n-15w, jkd and abnd 450 ft.

OKLAHOMA

Caddo County—W. Cement: Magnolia's Edwards 5, sw ne nw 1-5n-10w, Madrano 5498-5570 ft, 347 bbls, 1/16-in, td 5621 ft.

Caddo County: Gulf's Sherritt 3, c ne se ne 33-6n-10w, Madrano 5631 ft, 848 bbls, 5892 ft.

Creek County—SE Stroud: Crosbie's Elle 5, se sw ne 17-14n-7e, Prue 2861 ft, shot 290 qts 2870-2945 ft, flow 45 bbls, 2952 ft.

Creek County—Deep Fork: Sinclair Prairie's Watson "A," se nw se 16-14n-8e, Skinner 2414 ft, shot 80 qts 2429-2457 ft, pump 60 bbls, 2460 ft.

Creek County—Glenn: Gulf's Drew-Clanton 1, se se se 6-17n-12e, Glenn 1456 ft, 1628 ft.

Creek County: Gulf's Pitman, L 31, ne se sw 7-17n-12e, Glenn 1449 ft, td 1531 ft, pb 1492 ft.

Creek County—Olive: M. L. Marr's Kelly & King 2, sw sw sw 35-18n-8e, Red Fork 2558 ft, shot 62 qts 2560-82 ft, pump 17 bbls, 2582 ft.

Garvin County—Pauls Valley: Texas Co.'s Cox 3, se ne nw 25-4n-1w, pump 346 bbls fr Penn, td 4087 ft, pb 4063 ft.

Pure's Jackson-Cashan-Teter 2, nw nw se 31-4n-1e, Penn 3855-60 ft, 3888-93 ft, 11,000,000 gas, td 4655 ft, pb 3957 ft.

Pure-Stanolind's Teter-Cashian 1, nw ne ne 31-4n-1e, Penn 3980-87 ft, sd 3991-95 ft, sd 4045-53 ft, shot 20 qts 4037-4047 ft, flow 40.83 bbls, ¾-in, td 4217 ft, pb 4075 ft.

Pure's Irick 1, se se nw 36-4n-1w, Penn 4017-25 ft, 4046-59 ft, flow 117.44 bbls, td 4144 ft.

Hughes County—Unnamed: R. J. Delaney's White, se nw se 28-6n-8e, Booch 2722 ft, td 2755 ft.

Jackson County—Altus: N. B. Goldsmith's Alice 1, sw nw se 11-1n-20w, sd 1394-1404 ft, Granite Wash 1520-1540 ft, pump 15 bbls, 1540 ft.

Goldsmith's Walls 5, sw nw nw 11-1n-20w, Granite Wash 1374-1405 ft, Granite Wash 1405-1420 ft, pump 15 bbls, td 1420 ft.

Kay County—Kilworth: R. Stephens' Warren 4, se sw nw 19-28n-1e, 2nd Wilcox 3389-3394 ft, pump 104 bbls, td 3395 ft.

Noble County—NE Liberty: Ptak's Verealeau 1A, nw se ne 10-22n-2e, 2nd Wilcox 4391 ft, flow 181 bbls oil 5 bbls wtr, 4402 ft.

Okfuskee County — N W Bearden: Texas' Stevenson 1, nw sw nw 32-11n-9e, Cromwell 3763 ft.

Titus' Dunson 1, sw nw se 36-11n-8e, Cromwell 3462 ft, 2,000,000 gas, 10 bbls, 3481 ft.

Oklahoma County—Oklahoma City: Peppers Ref.'s Blk 7, sw sw sw 27-12n-3w, sdy dolomite 6440 ft, shot 35 qts 6500-6530 ft, 20 qts 6520-6530 ft, 144 bbls, 6530 ft.

Oklahoma County—W. Edmond: Denver P & R's Genzer 2, c nw nw 5-13n-4w, Hunton 6912 ft, 200 bbls, 12/16-in, 7036 ft.

Sohio's Bean 1, se se nw 29-14n-4w, 6828 ft, Hunton, 1000 gals acid, 185 bbls, 1-in, 7098 ft.

Sohio's Briscoe 1, se se ne 30-14n-4w, Hunton 6817 ft, perf 1000 gals acid, flow 300 bbls, 3/16-in, 7133 ft.

Pottawatomie County—NW Earlsboro: Atlantic's Campbell 1, c ne se 1-9n-4e, Hunton

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USED EQUIPMENT FORUM

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■ FOR SALE: 1 Emsco Steam Rig Complete 1 Emsco Power Rig Complete both equipped with new 4½" Drill pipe, also a quantity of 2⅞" OD, 3½" OD, 4½" OD and 6⅝" OD Drill Pipe. Other drilling equipment. H. D. BILES, 706 First National Bank Bldg. Fort Worth, Texas.

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■ For Sale: 1 Clark 120 H. P. drilling engine with reversible clutch. Claud White, Breckenridge, Texas or J. L. Higginbotham, 2514 Commerce St., Dallas, Texas.

■ FOR SALE: (Near Corpus Christi) Production Equipment for four 7100' wells, consisting of 28,000' 2" upset 8 Rd. Thread Tubing. 2 High 500 Bbl. Tanks - 1 Gun-Bbl., 1 National Separator, 4 Complete Xmas Trees w/ Braden Heads, Valves & Fittings, 6000' 2" Line Pipe; 1 - 100 H.P. Twin Superior Compressor w/ 2 sets cyclinders (1 High and 1 Low Pressure), 4 Automatic Intermitters. All this equipment in good serviceable condition. Ceiling Price. Write: Box 781, Aransas Pass, Texas.

■ FOR SALE: 30' x 40' Portable Steel Bldg., newly painted and finished for Oil Show on 30 x 60 space located at Tulsa Oil Exposition Grounds, w/ space lease paid up through next Show period. Will sell building and lease for $2500.00. Write Box 781, Aransas Pass, Texas.

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NOTICE of Oil and Gas Lease Sale. Southern Ute Indians will lease by bid approximately 1280 acres. Bids to be opened March 15, 1944. Information may be secured from Floyd E. MacSpadden, Superintendent, Consolidated Ute Indian Agency, Ignacio, Colo.

WANTED

WANTED

GAS RECYCLING PROJECT

By large, independent having available, new, complete compression equipment capable of handling large volume and high pressures. Interested in high pressure wet gas area, good gasoline content, good reserves, sufficient wells already drilled for a recycling operation. Prefer project with gasoline extraction plant already operating but with limited market for residue dry gas. Give all information possible first letter. P. O. Box 1914, Fort Worth, Texas.

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■ Water pump 30-gpm. 450-lb., 10-hp. Electric motor, Centrifugal water pump 350-gpm. 40-ft. head with electric motor. H. S. Milam, Chelsea, Okla.

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NOTICES

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ADVERTISING RATES

TRADING POST SECTION

Regular classified advertisements for this special section, set in type this size without border, take flat rate of 7 cents per word for the first insertion and 5 cents per word for each subsequent insertion of same copy. Display advertisements for this section, set in suitably larger type with ruled border, are $5.00 per inch for first insertion and $4.00 per inch for subsequent insertions. Remittance must accompany copy which should be sent to:

Trading Post Section. THE OIL WEEKLY
P. O. Box 2608 Houston 1. Texas

4183 ft, flow 180 bbls, 18/64-in, td 435 ft, pb 4280 ft.

Pottawatomie County—Unnamed: Mid-Continent's Cegar 1, ne sw ne 6-9n-4e, Wilcox 5262 ft, abnd 5272 ft.

Seminole County—Fish Pool: F. P. Lanahan's Collier 3, se ne ne 13-7n-7e, 3rd Calvin 1570-1625 ft, abnd 1637 ft.

Troup & Moore's Fish 3, se se ne 19-7n-8e, Calvin 1449 ft, shot 80 qts 1454-73 ft, 125 bbls, 1484 ft.

Seminole County—N. Wewoka: Royal Pet. Corp.'s J. B. Aldridge 1, se sw se 32-9n-8e, Simpson 4436 ft, abnd 4454 ft.

Seminole County—Cromwell: H. H. Diamond Kions 1, ne ne se, Cromwell 3535 ft, abnd 3575 ft.

Stephens County—Comanche: Geo. Pace's Hillery 3, se nw ne 20-28-7w, broken sd 1310-1320 ft, sand 1321-31 ft, 15 bbls, td 1331 ft.

Tulsa County—Keystone: L. B. Jackson's Bartlett 5, ne se ne 10-19n-10e, Layton 475-92 ft, 1½ bbls oil, 45 bbls wtr, td 1741 ft, pb 507 ft.

OKLAHOMA WILDCATS

Coal County—Failure: Pure's Edwards 1, se ne nw 28-2n-9e, McCl 1270-80 ft, abnd 2002 ft.

Hughes County—Discovery: Aladdin Pet.'s Austin 1, c sw nw 4-7n-10e, perf 3 shots 3582-85 ft, perf 1 hole 3494 ft, 2,700,000 gas, perf 3 shots 3496-98 ft, 27,149,850 gas, td 3641 ft.

Hughes County — Failure: Northern Ordnance's Anglin-Stevenson 1, sw ne ne 36-8n-11e, sd 1530-40 ft, sd 1572-1577 ft, sdy shale 1580-90 ft, pb and abnd 1500 ft.

Payne County—Discovery: Sun's Morgan 1, ne ne sw 10-19n-5e, 500 gals acid, est 2,000,000 gas, est 5 bbls; 120 shots 3566-3626 ft, flow 30 bbls 32-gr oil, 20 wtr, ½-in, td 3678 ft, pb 3624 ft.

Seminole County—Failure: Winona's Cade 1, ne nw se 12-10n-7e, Cromwell 3581-2670 ft, 1st Wx 4353 ft, 2nd Wx 4388, abnd 4452 ft.

WEST TEXAS

Andrews County—Fullerton: Fullerton Oil Co.'s McKean-Eilers 3, c sw se PSL 14, blk A-32, flow 819 bbls, 20/64-in, 7000 gals acid 6802-7140 ft, td 7244 ft, pb 7140 ft.

Andrews County—Mascho: Phillips' University-Texas 4, 567 ft snl 2033 ft ewl sec 4, blk 10, flow 117 bbls, ¼-in, 5000 gals acid 4294-4600 ft.

Phillips' University 2-C, 1887 ft snl 2033 ft wel sec 4, blk 10, flow 81 bbls, ¼-in, 5000 gals acid 4294-4614 ft.

Phillips' University 4-C, 567 ft snl 2033 ft wel sec 4, blk 10, flow 81 bbls, ¼-in, 5000 gals acid 4300-4619 ft.

Cochran County — Slaughter: Stanolind's Boyd 17, 991 ft nsl 1054 ft wel lge 53, Oldham CSL, flow 861 bbls, 9000 gals acid 5015-82 ft.

Texas Co.'s Mallet 16-F, 580 ft out nw cor lab 25, lge 51, Scurry CSL, flow 921 bbls, 10,000 gals acid 5015-40 ft.

Crockett County—Olson: Plymouth Oil Co.'s Owens 1-M, 1049 ft snl 995 ft wel, T&NO Ry. 9, blk GG, pump 33 bbls, shot 220 qts 2109-73 ft, td 2194 ft.

Ector County—Foster: Union Oil Co. of Cal.'s Kone 3, c se sw T&P 41, blk 42, T-2-S, pump 65 bbls, shot 480 qts 4545-4625 ft, td 4635 ft.

Ector County—North Cowden: Texas Co.'s Holt 32, c se sw T&P 11, blk 43, T-1-N, pump 247 bbls, shot 340 qts 4410-4590 ft.

Gaines County—Seminole: Amerada's Turlin 16, c ne ne W. T. Ry. 218, block G, flow 116 bbls, ½-in, shot 106 qts 5242-5300 ft.

C. U. Bay et al's Austin-Humble 1-C, c ne sw W. T. Ry. 190, blk G, flow 491 bbls, ½-in, shot 100 qts 5175-5227 ft.

Hockley County—Slaughter: T. F. Morrow et al's Oil Dev. Co. 9, 1450 ft snl 1338 ft ewl lab 24, lge 45, Edwards CSL, flow 295 bbls, 2-in, 6000 gals acid 4890-4929 ft.

Texas Co.'s Slaughter 150, 1450 ft snl 1331 ft wel lab 78, lge 38, Zavalla CSL, flow 988 bbls, 11,000 gals acid 4955-5012 ft.

Howard County—Iatan-East Howard: Cosden Pet. Corp.'s Read 1-B, se ne sw T&P 48, blk 30, T-1-N, pump 100 bbls oil, 50 bbls wtr, shot 720 qts 2770-3000 ft.

Mitchell County—Westbrook: Col-Tex Ref Co.'s Abrams-T. P. Land Trust 12, 1653 ft snl 986 ft ewl T&P 33, blk 28, T-1-N, pump 58 bbls oil, 3 bbls wtr, shot 1060 qts 2930-3080 ft.

Col-Tex's Morrison 17, 2319 ft nsl 330 ft wel T&P 20, blk 28, T-1-N, pump 53 bbls, shot 1240 qts 2985-3110 ft.

Col-Tex's Pettitfils 2-B, 1656 ft snl 341 ft wel T&P 14, blk 28, T-1-N, pump 42 bbls, shot 1260 qts 2980-3095 ft.

Reagan County—Barnhart: Amerada's Hickman 1-A, 660 ft nsl 2008 ft ewl T&P 233, blk 1, elev 2779 ft, black shale 8920 ft, flow 2180 bbls, 1-in, 4900 gals acid, Ellen perf 8938-62, 8977-94 ft, td 9310 ft.

Scurry County—Sharon Ridge: R. J. and D. H. Byrd's Sterling 3, sw se sw H&TC 140, blk 97, pump 62 bbls, shot 800 qts 2350-2510 ft, td 2550 ft.

Ward County—Gulf-O'Brien: Gulf's Hutchings 173, 1728 ft snl 1584 ft wel G&MMB&A sec 9, blk 0, flow 668 bbls, 2-in, shot 140 qts 2630-76 ft, td 2705 ft.

WEST TEXAS OLD WELL DEEPENED

Upton County—McCamey: Stanolind's Burleson 48, 1415 ft nsl 1650 ft wel sec 2, J. Nidever sur, otd 2040 ft, pump 39 bbls oil 39 bbls wtr, 1500 gals acid 2020-2100 ft.

WEST TEXAS WILDCAT

Pecos County—Failure: Phillips' Pascoe-Byrne 1, c se nw H&GN 114, blk 11, elev 2448 ft, Permian 4445 ft, granite 4640 ft, abnd 4645 ft.

WEST TEXAS EXTENSION

Yoakum County — Wasson Field: Woodley Pet. Co.'s Farmer-Honolulu 1, c sw sw sec 635, blk D, J. H. Gibson sur, elev 3625 ft, anhydrite 2353 ft, salt 3125 ft, San Andres 4620 ft, pump 134 bbls, 11,000 gals acid 5230-5315 ft, td 5340 ft, extends Wasson field 2 mi n.

WEST CENTRAL TEXAS

Coleman County: Anzac Oil Corp. et al's Hinds 2, 400 ft snl 1100 ft wel se¼, J. H. Barkley sur No. 700, pump 84 bbls oil 6% bs&w, sand 2100-06 ft.

Jones County — South Noodle: Humble's Huddleston 4-C, 467 ft nsl 345 ft ewl ne T&P 33, blk 18, elev 1838 ft, pump 152 bbls, 5000 gals acid, 2422-28 ft, td 2432 ft.

Shackelford County: W. H. Rogers, Jr., et ewl T&P 48, blk 14, abnd 1570 ft.

Stephens County: Lone Star Producing Co.'s Compton 2, 1314 ft snl 1303 ft ewl T&P 40, blk 7, elev 1344 ft, Bend 3412 ft, abnd 4370 ft.

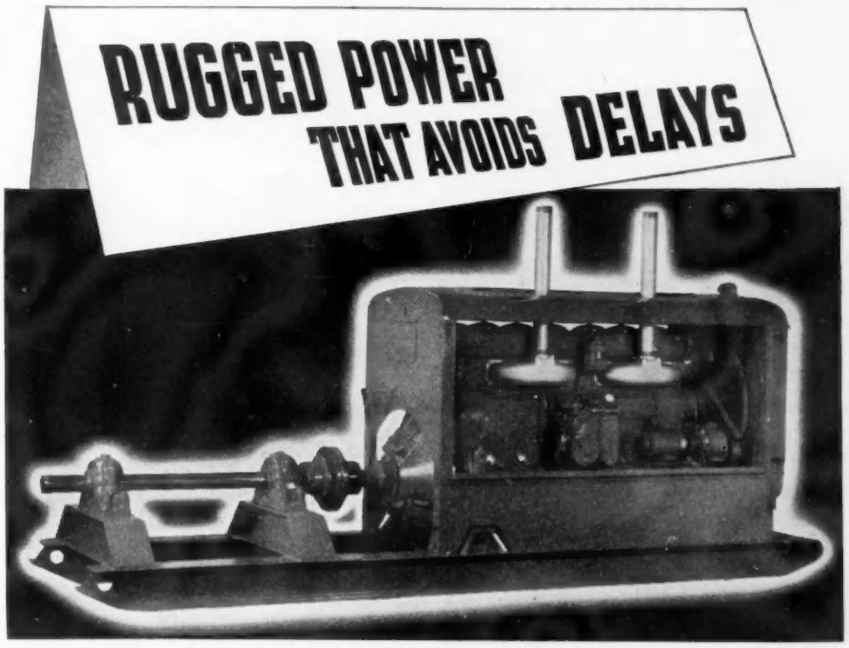
Stephens County—Loving: Wittmer O&G Prop.-Knight & Ewing's Compton 2-B, c ne se Orphan Asylum Lands sec 8, flow 168 bbls, 14/64-in, 5000 gals acid, 3486-3529 ft.

Taylor County—Reddin: West Central Dr. Co.'s Reddin 1, 780 ft ewl 330 ft nsl T&P 25, blk 17, otd 2251 ft, dual comp, flow 1152 bbls, ½-in, 3000 gals acid, perf 2472-2552 ft, td 2654 ft.

WEST CENTRAL TEXAS WILDCATS

Jones County—Failure: Merry Bros. & Peal's Davis & Walker 1, 1070 ft snl 1900 ft rini and Alder Oil Co.'s Agnew 1, 330 ft out sw cor of e-200 ac tr in s½ BBB&C sec 44, elev 1681 ft, Dothan 2031-35 ft, abnd 3197 ft.

Taylor County — Failure: Northern Ordnance's Toombs 1, nw nw se S.P.Ry. 12, blk 9, elev 2026 ft, jkd and abnd 1440 ft.



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SOUTHWEST TEXAS

McMullen County—Green Branch: Quintana Petroleum Corp.'s South Texas Synd. C-8, 2135 el 2046 sl BS&F sur 19, A-88, abnd 6422 ft.

SOUTHWEST TEXAS WILDCAT

Duval County—Failure: Atlantic's Martex-Welder A-2, 2300 fr ne&sel, M. G. Nunez sur 4, A-367, 1151.75-ac lse, 13 mi nw San Diego, abnd 4007 ft.

SOUTH CENTRAL TEXAS WILDCATS

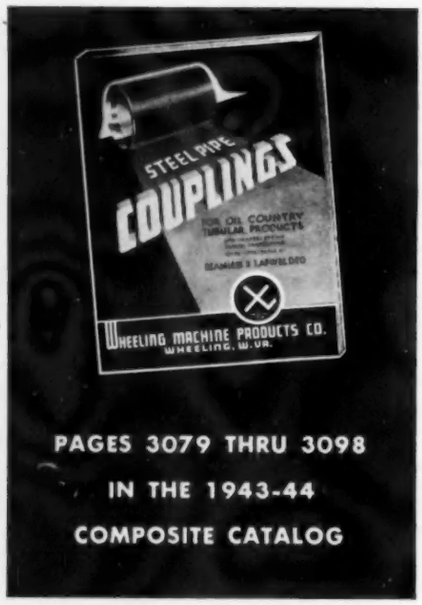
Caldwell County—Failure: A. E. Morgan's Aileen Taft 2, 2880 fr sw 660 fr w'ly nwl, Jonathan Burleson sur, elev 550 ft, abnd 1908 ft.

Wilson County—Discovery: W. B. Phipps' R. J. Hubinger 1, 833 fr sw 440 fr nwl of ne 200-ac of 266-ac tr, 8000 fr nel, Felipe Flau sur 9, elev 510 ft, top sd 1709, pump est 12 bbls, 1717 ft.

LOWER TEXAS COAST

Bee County—Blanconia: Stanolind's Cyrus Fox 1, 3000 fr se 5300 fr nl, Michael O'Donnell sur A-50, elev 90, dual comp, Frio 4018 ft, perf 12 shots 4020-24 ft, flow est 14,500,000 gas csg; Vicks 4964-73 ft, perf 4971-72 ft, pump 62 bbls 25-gr, 9/64-in, 11,370/1, td 4973 ft.

Windsor Oil Co.'s J. J. O'Brien 1, 330 fr e 2000 fr nl of tr 11, 640-ac lse, Michael O'Donnell sur, Vicks 4999-5017, sso 3650, Frio 4012-30 ft, 5½ 4805 ft, perf 32 shots 4014-22, pump 15,000,000 gas, ¼-in, 1750 lbs, td 5109 ft.



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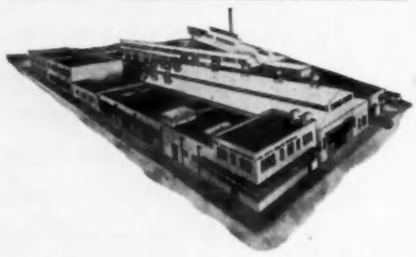
IN THE 1943-44

COMPOSITE CATALOG



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OIL CITY BRASS WORKS
FOUNDERS MANUFACTURERS MACHINISTS
Beaumont, Texas, U.S.A.

Dewitt County—Slick-Wilcox: Transwestern Oil Co.'s Riedel 3, 400 fr nw 345 fr swl in w cor 80-ac lse, W. C. Brown sur, elev 325 ft, pay 7563 ft, 5½ 7618 ft, perf 7578-83 ft, 7587-97 ft, pump 223 bbls 35.4-gr, 3/32-in, td 7618 ft.

Jackson County—Maubro: Humble's Mike Strauss 7, 475 fr n 1457 fr el 530.78-ac lse, Abraham Clare sur, sd 5218 ft, 5½ 5998 ft, perf 5218-28 ft, pump 6.76 bbls 25.5-gr, 1/16-in, td 8203 ft, pb 5230 ft.

Jackson County—N. Laward: Cities Service's Chamrad 6, 470 fr s 385 fr wl 225.8-ac lse, Pickering Rch subdvn, Jessie White sur, elev 40, sd 5173 ft, 5½ 5232 ft, perf 48 shots 5206-22 ft, pump 50 bbls 25.3-gr, 3/32-in, td 5232 ft.

Jackson County—W. Ganado: J. C. Wynne's Hamons & Zetka 1, 330 fr n&el 40-ac lse, Wm. Menefee sur, abnd 5524 ft.

Jackson County—W. Ranch: Humble's Mrs. H. M. Toney 17, 508 fr ne 500 fr sel 385.08-ac lse, Hamon Musquez Gr, sd 5539 ft, 5½ 5738 ft, perf 90 shots 5539-5[illegible] ft, pump 281.28 bbls 30.6-gr, ¼-in, td 5746 ft, pb 5569 ft.

Jim Wells County—Seelingson: Shell's Lillie Seelingson 15, 3175 fr n 631 fr w'ly wl 990.31-ac lse, Willis Millican sur 335, elev 167 ft, rework and duel comp, perf 100 shots 5971-6010 ft, pump 150.85 bbls 41.2-gr, 7/64-in; perf 40 shots 5510-20 ft, pump 99.27 bbls 41.8-gr, 7/64-in td 6060 ft, pb 6014 ft.

Sun's J. W. Miller 15, 460 fr wl 660 fr nl sec 66, R. P. Haldeman subdvn Seeligson Rch, 919.13-ac lse, Nancy Russell sur 336, dual comp, 2/38 6124 ft, sd 6126-38 ft, perf 24 shots 6124-32 ft, pump 75 bbls 43-gr, 3/16-in; sd 5897-5921 ft, perf 24 shots 5915-21 ft, pump 162 bbls 43-gr, ⅛-in, td 6138 ft.

Nueces County—Baldwin: Magnolia's J. C. Baldwin 15, 725 fr e 309 fr sl, J. S. McGregor sur 39, sd 3903-15 ft, perf 15 shots 3905-08 ft, pump 427 bbls jet 25.4-gr, td 3940 ft.

Nueces County—Stratton: Lonnie Glassock's J. M. Imken 2, 467 fr w 1457 fr sl 320-ac lse w½ sec 167, F. Z. Bishop subdvn, Paso Ancho Abajo Gr, abnd 7520 ft.

Nueces County—N. Stratton: 724½ fr n&sl 1551½ fr el 160-ac lse on Rivers Est., 801.25-ac tr, sd 5698 ft, 5½ 5799 ft, perf 20 shots 5710-15 ft, pump 157.22 bbls 43.6-gr, ⅛-in, td 5799 ft.

Victoria County—McFaddin: Barnsdall's F. P. Marberry 13, 500 fr s&wl 95.16-ac tr, F. & J. M. Rodriguez Gr, sd 5489 ft, 5½ 5795 ft, perf 24 shots 5489-94 ft, pump 140 bbls 42.6-gr, ⅛-in, td 7250 ft.

Willacy County—Willamar: Pan American Prod. Co.'s Antonio Lozano 1, 1438 fr e 467 fr sl 190-ac tr in Sh 12, San Juan de Carricitos Gr, elev 16 ft, sd 7848-8004 ft, perf 140 shots 7980-8004 ft, pump 195 bbls 31.2-gr, 316-in, td 8023 ft.

Standard of Kansas' Luciana Cavazos 1, 467 fr n&el lot 5, S. Garcia subdvn Sh 12, San Juan de Carricitos Gr, sds 7896-8007 ft, 5½ 8011 ft, perf 94 shots 7991-8007 ft, pump 178 bbls 31-gr, 3/16-in, td 8011 ft.

LOWER TEXAS COAST EXTENSION

Willacy County—Willimar Outpost: Baldridge-King-Nichols' Leonardo Rosales et al 1, 2900 fr el 467 fr nl 467 fr w or swl 169.71-ac lse Sh 7, San Juan de Carricitos Gr, elev 13, sd 7865 ft, 5½ 7930 ft, perf 140 shots 7865-89 ft, pump 628 bbls, ¼-in, 500/1, td 7984 ft.

LOWER TEXAS COAST NEW PAYS

Jackson County—W. Ganado: Pure's Della Weise 1, 467 fr wl 376 fr n&sl 130-ac lse, Wm. Menefee sur, elev 62, rework 6190 ft, perf 66 shots 6174-88 ft, pump 104 bbls 33.8-gr, 7/64-in, td 6360 ft.

Nueces County—E. White Point: W. R. Oil Co.'s State-Nueces Bay 5 (973), 330 fr swl 161.6-ac lse State tr 973, Nueces Bay, elev 3½ ft, rework to dual comp, Meyers sd (new pay) 5650 ft, perf 5650-60, pump 78.24 bbls 40.3-gr, 9/64-in, 5660 ft.

LOWER TEXAS COAST WILDCAT

Jim Wells County—Discovery: Humble's E. M. Brownlee 1, 2175 fr w 3790 fr sl 1014-ac lse, J. Wright sur 19, elev 174 ft, sd 4948-54 ft, 5½ 4985 ft, perf 24 shots 4948-50 ft, pump 32 bbls 43-gr, ⅛-in, 8015/1, td 5373 ft.

TEXAS GULF COAST

Chambers County—Fig Ridge: J. M. Frost's Fee A-3, 467 fr n&el sw nw 40-ac tr HT&B sur, sec 95, A-149, sd 8525, 5½-in 8576 ft, perf 8500 ft, pump 490 bbls 35.3-gr, ¼-in, td 8577 ft.

Hardin County—Sour Lake: Earl Hankamer et al's Stanolind O&G Co. et al 1, 10.1-ac tr, Stephen Jackson sur, elev 44 ft, sd 2576 ft, perf 92 shots 2634-52 ft, 2⅝-in 2630 ft, pump 109 bbls 18.4-gr, 12/64-in, td 2751 ft.

Jefferson County — Lovell Lake: Humble's Broussard Tr. 49, 8063.7 fr n 3923 fr el of lse, C. Hillebrandt sur, elev 10 ft, perf 8 shots 7720-21 ft, pump 136 bbls 37.4-gr oil, 40% wtr, 3/16-in, td 7810 ft, pb 7762 ft.

Jefferson County—Farnett: Gulf's Bordages et al A-13, 1005 fr n'ly 425 fr w'ly el 2322 fr wl 320-ac tr, elev 12 ft, td 8297 ft, pb and abnd 7357 ft.

Matagorda County — N. Markham: Ohio's J. C. Carlson 23, 1646 fr sl Jacob Robertson sur 512 fr el 2779.13-ac lse, Cornelius 7714 ft, 5½-in 8126 ft, perf 7714-19 ft, pump 77 bbls 35-gr, ⅛-in, 453/1, 1175 lbs, td 8126 ft.

Tyler County—Ramer Island: American Republics Corp.-Houston Oil Co. of Texas' Cushing-Fee R-3, 3547 fr n 8657 fr wl, T. Cushing Lge A-14, elev 41.6 ft, 5½-in 5395 ft, perf 5388-91 ft, 5391-94, sd 5391, pump 505 bbls 39.8-gr oil, 8% wtr, ¼-in, td 5399 ft.

Tyler County—Rockland: Humble's Kountze et al 2, 990 n 2310 e of ne cor 80-ac tr, Emily Smyth sur, lot 11, sdy shale, abnd 3575 ft.

Waller County—Katy, N. Flank: Humble's Harry Herbert 2, 660 ft fr n&wl 160-ac tr, sec 113, blk 1, sd 6624 ft, 5½-in 6854 ft, pump 65 bbls 46.2-gr oil, 5% wtr, ⅛-in, 485/1, td 6868 ft.

Wharton County — Boling: Pan American Prod. Co.'s J. Brooks Gary 2, 830.59-ac tr, S. F. Austin Lge, 1 mile of Boling twst, abnd 7898 ft.

TEXAS GULF COAST WILDCATS

Fort Bend County — Failure: Superior of Calif.'s Mary Lockwood et al 1, 5039 s 6776 e nw cor, Silas Jones sur, 710.90-ac lse, Wm. McMahon sur, abnd 8293 ft.

Jefferson County — Failure: Glenn McCarthy's Henry Matheis 1, nw Stowell field, 439 fr n 806 fr el 50.12-ac tr in n end lot 30, Theo Koch subdvn, Francisco Valmore sur, abnd 10,200 ft.

Matagorda County—Failure: Atlantic's Denman Kountze B-1, 990 w 970 n of se cor 158.69-ac tr, W. H. Gainer sur, sec 550, tr 9, abnd 7366 ft.

Polk County—Failure: Humble's Carter & Bro. C-1, 660 fr s 966 fr el 1070-ac lse, Jas. Finley sur, 3 mi wnw of Segno field, abnd 8897 ft.

Trinity County—Failure: American Liberty Oil Co.'s Due 1, 330 fr ne&nwl 60-ac lse, S. E. Buffington sur, abnd 5520 ft.

EAST TEXAS

Smith County — Chapel Hill: Texas Co.'s Phillips 3, ¼-m e of Phillips 2 660 ft nsl 349.48-ac lse, W. W. Hanks sur, elev 454 ft, flow 111 bbls 1-in, 4000 gals acid, Pettit 8166-82 ft, td 8372 ft.

Wood County — Manziel: Magnolia - Sun's Howle-Scoggin 1, 588 ft ewl 467 ft fr m/n/sl of 36.54-ac unit, Sam Burch sur, Paluxy series 6260 ft, sd 6280-6300, 6310-32 ft, flow 341 bbls, ¼-in, perf 6311-27 ft, td 6337 ft.

Chas. L. McMahon's Hudson 2, 2350 ft snl 4050 ft wel, Sam Burch sur, elev 443 ft, Paluxy series 6302 ft, sd 6314-80 ft, flow 562 bbls, ¼-in, perf 6314-64 ft, td 6385 ft.

Sun's Scoggin 2, 905 ft ewl 770 ft nsl of 100-ac tr, Sam Burch sur, elev 435 ft, Paluxy series 6309 ft, sd 6346 ft, flow 435 bbls, ¼-in, perf 6347-58 ft, td 6404 ft.

EAST TEXAS WILDCATS

Anderson County—Failure: V. J. Meyer et al's Ball 1, 2134 ft w alg sl fr m/s/se cor of 920-ac part of 3333½-ac tr th s 1197 ft at ra, Muriana R. Palacious sur, elev 246 ft, Pecan 4164 ft, very low, abnd 4174 ft.

Henderson County—Failure: E. B. Germany & Sons' Bentley 1, 467 ft snl 750 ft wel of 94.3-ac tr, Nathaniel Addison sur, elev 304 ft, Pecan 2037-2250 ft, Austin 2960 ft, Woodbine 3770 ft, abnd 3791 ft.

Hunt County—Failure: Hollandsworth Dr. Co.-W. F. Nenny's John Hancock Mutual Life-Magnolia 1, 1148 ft e 1299 ft s of m/n/nw cor, J. H. Handlin sur, elev 526 ft, Pecan 870 ft, Gober 1449 ft, Austin 2240 ft, Woodbine 2710 ft, abnd 2733 ft.

NORTH TEXAS

Archer County: M. W. Blair Oil Co.'s Henry 8, 1800 ft snl 3190 ft wel sec 35, blk 5, Clark-Plumb sur, pump 10 bbls, 927-33 ft, td 946 ft.

M. W. Blair Oil Co.'s Henry 9, 1800 ft snl 165 ft ewl sec 35, blk 5, Clark-Plumb sur, abnd 960 ft.

White & Duncan's Kinder 5-61, 1380 ft nsl 170 ft ewl sec 61, blk 5, Clark-Plumb sur, abnd 2340 ft.

Cooke County—Dangle: Phillips' Danglemyer 2, 4870 ft wel 635 ft snl of 509-ac tr, E. Langford sur A-566, Danglemyer sand 1612 ft, Ellen 2308 ft, pump 72 bbls, acid 700 gals 2308-15 ft.

Phillips' Danglemyer 3, 600 ft nsl 1400 ft ewl of n 260 of 1001-ac tr, E. Langford sur, Ellen 2356 ft, flow 541 bbls, ½-in, natural, 2359-66 ft.

Jack County: Rathke Oil Co.'s Slusher 1, 1980 ft fr swl 660 ft fr sel J. M. Brown sur A-59, elev 1007 ft, Marble Falls 4418 ft, pump 9 bbls, shot 25 qts 4740-50 ft, td 4803 ft, pb 4760 ft.

Montague County: Pure's Jones 8-A, lse 2, 4200 ft nsl 4325 ft ewl, Wm. Donohoo sur A-178, lot 37, 1500 gas, perf 616-768 ft, td 945 ft.

Wichita County: W. H. Peckham et al's Bailey 1, 2560 ft nsl 1986 ft fr wl H. Hastie sur A-96, lot 6, pump 10 bbls, 1313-30 ft.

Hanlon & Buchanan's Burnett 22-AA "A", 3100 ft snl 2535 ft ewl H&GN 34, A-435, abnd 901 ft.

Texas Co.'s Waggoner Est. 445-A, 2147 ft ft m/n/n sec 20 on el sec 2, T.C.Ry. A-632, pump 2 bbls, shot 5 qts 537-41 ft, td 543 ft.

Wichita County—West: Ohio Oil Co.'s Barber 2, 403 ft snl 415 ft ewl 100-ac lse, J. R. Cooke sur, KMA 4263 ft, flow 225 bbls, 24/64-in, shot 60 qts 4253-72 ft, td 4280 ft.

Young County: Belfort Oil Co.'s Tidwell 1, 330 ft out nw cor T&NO sec 10, A-2149, pump 17 bbls, shot 120 qts 3486-3520 ft, td 3856 ft, pb 3522 ft.

NORTH TEXAS WILDCATS

Archer County—Discovery: Martin Properties, John Purcell 1, 600 ft snl 200 ft wel of 63¼-ac tract, Jose Ostane sur A-333, 1½ mi nw Archer City, pump 68 bbls 39.2-gr oil, 24 bbls wtr, sand 1150-54 ft.

Archer County—Failure: Texas Co.'s A. B. Edwards 1, 300 ft out sw cor blk 32, L. P. Hunt sur, abnd 1623 ft.

Clay County—Failure: Sussex Oil Co.'s Perkins 1, 200 ft snl 1050 ft wel blk 79, Byers sur, abnd 1152 ft.

WYOMING

Converse County—Big Muddy: Continental's Hursh 6, sw ne nw 16-33n-76w, flow 25 bbls, td 4560 ft.

United States Wildcat Starts

ARKANSAS

Lincoln County: Curtis Kinard's W. I. Payne 1, c ne se 18-10-7, lcn.

Union County: Marine Oil Co.'s Bank 1, c se se 7-19-13, old Hillsboro area, d&p.

Marine Oil Co.'s Fee A-1, (semi-wildcat) nw se ne 20-18-17, outside unit in Shuler area, Cotton Valley test.

CALIFORNIA

Fresno County: Sam Herndon's 1, nw nw nw 13-15-18, Raisin City area, lcn.

Kern County: Seaboard's Garrison-Davis 1, se nw se 30-29-29, Edison area, lcn.

Superior's F & W 1, se nw sw 23-29-21, McKittrick area, rig.

Western Gulf's Quinn 1, sw ne ne 8-25-27, Jasmine area, lcn.

Wilshire Oil Co.'s Cardoza 1, ne ne ne 7-30-29, Edison area, lcn.

Los Angeles County: Allegheny Pet. Corp.'s Rowland 1, ne se nw 14-2-10, Puente area, lcn.

Shell-Continental's 86-20, se ne se 20-5-17, Loma Verde area, lcn.

Sacramento County: Amerada's McGillivray's Comm. 1, se ne se 29-5-5, Galt area gas test, rig.

COLORADO

Rio Blanco County: California Co. et al's Emerald 1, c ne sw 30-2n-102w, Rangely field, moving in mat.

ILLINOIS

Clark County: L. D. King's D. L. Downey 1, ne ne sw 4-9n-13w, dr.

Clay County: Herndon Drlg.'s Laffey 1, se sw nw 17-3n-7w, dr.

Washington County: Magnolia's R. K. Torrens 1, ne ne nw 30-3s-3w, dr.

Wayne County: H. Paul Tick's Withrow 1, se ne 32-1s-5e, lcn.

Texas' F. M. Draper 1, n½ nw sw 8-3s-6e, dr.

Pure's C. A. Simmons 1, e½ sw se 9-1n-12w, lcn.

INDIANA

White County: B. M. Heath's Ed Daudistel 1, se se nw 32-5s-13w, lcn.

KANSAS

Barber County: Alpine Oil's Curry 1, se c 5-31s-12w, lcn.

Barton County: Helmerich & Payne's Willcut 1, nw c 15-19s-15w, mirt.

Clay County: Wolf Creek et al's Mustard 1, sw c ne 17-11s-1e, c&p.

Dickinson County: Stanolind's Equitable Life 1, ne nw se 17-12s-1e, lcn.

Ellis County: Nelson Drlg.'s Fischer 1, se se nw 9-11s-20w, dr 1250 ft.

Meade County: Northern Ordnance's Isaacs 1, nw c 19-33s-27w, dr 3900 ft.

McPherson County: Anderson Prichard's Bishop 1, se c 21-18s-1w, lcn.

Morton County: Eason Oil Co.'s Craver 1, se c 32-34s-42w, Miss 4700 ft.

Rice County: Colorado Pet.'s Minnie Boldt 1, nw se nw 20-16s-9w, dr 11 ft.

Russell County: Frontier Fuel's Short 1, sw ne nw 31-14s-12w, lcn.

KENTUCKY

Butler County: Frontier Fuel Oil-Ryan's C. O. Davis 1, c nw ne 15-H-38, dr.

Hopkins County: A. D. Schaeffer's Baker-Hickman 1, c ne ne 19-J-25, lcn.

McLean County: Kingwood Oil Co.'s Riley 1, se se se 21-L-27, dr.

Ohio County: Producers Pipe Line's C. C. Price 1, 3450 ft sl 9600 ft el, 22-M-30, dr.

SOUTH LOUISIANA

Assumption Parish: Humble's A. G. Robichaux 1, start sw cor sec 100 go nwly at ra to sel of sec 100 for 660 ft to lcn in 100-14s-15e, 11,500-ft test.

Cameron Parish: Humble's Cameron Parish Sch. Bd. 1, start nw cor sec 16 go sly alg wl 3300 th ely at ra 660 to lcn in 16-14s-5w, 11,000-ft test.

Iberia Parish: Texas Co.'s State Vermillion Bay C-2, s 80° 31 mins fr USCGS Mon. Club in Bay T-14s-5e, 11,500-ft test.

MICHIGAN

Allegan County: Wm. Moser's Brenner 1, nw ne nw 23-3n-13w, rig.

Arenac County: Bert Baker's State A1, nw sw nw 2-19n-3e, dr.

Genesee County: H. H. Heinig's Bardon 1, ne se ne 9-9n-8e, rig.

Iosco County: Ervin Major's Welch 1, se sw sw 33-23n-9e, lcn.

Ottawa County: P. K. DeGenther's Bonner 1, sw sw se 6-7n-13w, rig.

MONTANA

Musselshell County: Northern Ordnance's Morris B-1, c se nw 14-9n-26e, Gage dome, moving in mat.

NEBRASKA

Johnson County: Stanolind's Strat 8, c el of sec 8-5n-12e, comp.

Stanolind's Strat 9, sw nw nw 16-5n-12e, comp.

Stanolind's Strat 7, ne c 20-5n-12e, comp.

Redwillow County: Sinclair Prairie's Land Bank 1 (Strat), sw sw se 11-2n-28w, dr.

OKLAHOMA

Atoka County: Amerada-Stanolind's Leonard 1, se sw ne 25-3s-9e, Wapanucka lime 1965 ft, dr 2346 ft.

Greer County: E. K. McLennan's Dickson 1, nw nw ne 31-6n-21w, mach, dr 95 ft.

Hughes County: Stanolind-Amerada's Clark "A" 1, c e½ nw 21-5n-11e, lcn.

Deep Rock's J. F. Myers 1, se se ne 7-7n-10e, dr 2100 ft.

Jefferson County: Ohio's Ash 1, sw sw nw 17-5s-7w, cellar dug.

Oklahoma County: Ace Gutowsky's Funk 1, se sw 24-14n-5w, rog.

Osage County: Paul Badami's Osage 1, ne nw ne 31-29n-6e, rur.

WEST TEXAS

Cochran County: Helmerich & Payne's D. S. Wright 1, 660 ft out se cor lab 19, lge 97, Brewster CSL sur, lcn 6500-ft test.

Crockett County: John I. & P. D. Moore's Shannon 1, 660 ft out se cor sec 3, blk FF, Brooks & Burleson sur, lcn 2500-ft test.

John I. Moore et al's Shannon 1-24, 660 ft nsl 1980 ft ewl GC&SF Ry. 24, blk 1, lcn 2500-ft test.

Gaines County: DeKalb Agricultural Assn.'s J. J. Gaston 1, 660 ft out ne cor lab 7, lge 286, Schleicher CSL sur, lcn 6000-ft test.

WEST CENTRAL TEXAS

Comanche County: J. E. Whitesides & L. H. Choate's Carrol & Union Central Life Ins. Co. 1, 175 ft out sw cor sec 80, blk 1, Lampasas CSL sur, lcn 500-ft test.

NORTH TEXAS

Archer County: A. R. Dillard et al's H. H. Herndon 1, ne ne nw S. P. Ry. 1, A-434, 5½ mi se Dundee, lcn 5200-ft Ellenburger.

Denton County: Hassis Hunt et al's A. Martin 1, 660 ft s&e of m/s/nw cor of e-432-ac, J. Parks sur A-1008, lcn Ellenburger test.

Haskell County: Hunter & Hunter's A. E. Pardue 1-C, 1305 ft nsl 2257 ft wel, D. Taylor sur No 8, 1¼ mi ne Strand pool, lcn.

Wilbarger County: Humble's Karl Haseloff 1, c ne ne H&TC 35, blk 9, 5½ mi sw Vernon, lcn 5000-ft Ellenburger test.

Young County: Paul Atchley et al's Leberman 1, 1200 ft wel 1800 ft nsl sec 221, TE&L Co. sur, lcn.

L. T. Burns et al's G. W. Christian 1, 1500 ft snl on el sec 255, TE&L Co. sur, lcn 1000-ft test.

SOUTH CENTRAL TEXAS

Dimmett County: Robert Wheeler's Geo. Patchernick 1, 2640 fr sw ne nw lines blk 5, Good Luck Colony subdvn, 5700-ft test, dk.

Milam County: Fred Pederson, Jr.'s Yoakum 1, 330 fr n&el 50-ac lse, Jose Leal Gr, lcn 1500-ft test.

Williamson County: Fred Hughes' Chas. Bachmeyer 1, 330 fr e 1000 fr sl 71-ac lse, Cartwright sur, lcn 1100-ft test.

Wilson County: J. A. Caldwell's Ben Pierdolla 1, 265 sw Carpenter rd 265 fr se 465 fr nel 100-ac tr, J. F. Herrera Lge 6, mir.

SOUTHWEST TEXAS

Duval County: American Republics Corp.'s Richardson et al 1, 467 fr swl 2216 fr nwl H&GN sur 18, A-1781, 12 mi nw San Diego, 4000-ft test, dr 1200 ft.

Starr County: Sun's Solis 1, 467 fr s&el 112-ac lse, tr 30, porc 95, Juris of Camargo, lcn 5000-ft test.

Webb County: Coastal Refineries' Rosa de Benavides 1, 330 fr s&wl blk 4, sur 411, lcn 2350-ft test.

Dulup Oil Co.'s Bruni 1, 330 fr s&el blk 7,

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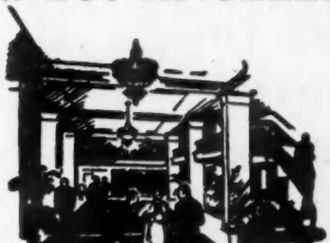

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330 fr e 3900 fr nl sur 835, elev 842 ft, 1800-ft test.

Sohio's Callagan Lnd. & Pastoral Co. A-1, 1600 fr wl 951 fr nl CCSD&RGNG sur 1339, 8000 ft test, mir.

Sohio's Sanchez 1, 990 fr wl 2310 fr nl 640-ac tr in nw cor H&OBRR sur 1146, mir.

Zapata County: Coastal Refineries' M. E. Leyendecker 1, 330 fr n&e 1, blk 19, Mary Atwood sur 412, elev 600 ft, 3500-ft test.

LOWER TEXAS COAST

Jackson County: W. Stewart Boyle's Andrew Lorenzen 1, 660 fr ne sel sec 1 C. W. Hahl subdvn of D. H. Burn Rnch, J. J. Linn sur, lcn 7000-ft Frio test.

Jim Wells County: Highland Oil Co.'s Joe Seiler 1, 467 fr s&e 1 of 51.28-ac tr, 3¼ mi fr sl of LaVaca Gr, mim.

EAST TEXAS

Cherokee County: Continental's Southern Pine Lbr. Co. 1, 330 ft out ne cor of 2270-ac lse, T. N. Jones sur, lcn.

Henderson County: Sun & Magnolia's Genecov & Roosth 1, 467 ft out sw cor of lse, Martin Murchison sur, Koon Kreek Club area, dk for 6000-ft test.

Wood County: Amerada's M. C. Sheppard 1, 467 ft o[illegible] ne cor w-40 ac of 100-ac lse, Samuel B[illegible] sur, lcn Paluxy test.

TEXAS GULF COAST

Montgomery County: Phillips' Foster Est. 1, 788 fr e 29[illegible] of 160-ac lse blk 34, Gholson subdvn, Jose[illegible] de la Garza sur, 11,000-ft test.

TEXAS PANHANDLE

Carson County: Skelly's Schafer 179, 440 ft snl 1320 ft ewl n[illegible] I&GN 196, blk 3, pump 207 bbls, shot 274 qts 3093-3145 ft.

Gray County: L[illegible] R. Hagy-Harrington & Marsh's Burke 2, c sw ne H&GN 207, blk B-2, elev 3283 ft, abnd 3045 ft.

Hutchinson County: Sinclair Prairie's Weatherly 20, 1980 ft nsl 1830 ft ewl sw A&B 23, blk Y, pump 243 bbls, shot 80 qts 3041-86 ft.

Moore County: Shamrock O&G Corp.'s W. H. Taylor 2, c sec 11, blk 1, J. Poitevent sur, dk up for Ellenburger test.

WYOMING

Big Horn County: General Petroleum's 2, nw cor 53-55n-97w, Garland, lcn.

Ohio Oil Co.'s 1, nw nw sw 13-56n-98w, Garland, lcn.

Squeaks from the Bull Wheel

Might Work

"You are the sixth girl to whom I have proposed without avail."

"Well, maybe if you wear one when making your seventh proposal, you'll have better luck."

You Know the Type

They were discussing fainting at the first aid class. The instructor explained that the primary cause of fainting was a fault of circulation, and the way to prevent it was by getting the head lower than the heart.

"For instance," he said, "if you feel faint and don't want to call attention to the fact, just lean down and tie your shoelace over and over again."

A woman in the class raised her hand. "What sort of a knot is used?"

Real Reason

"What's the mater, Mary?"
"I've got rheumatism in my muscles."
"You ought to visit a masseur."
"What's that?"
"A man who pinches you all over."
"Oh, you mean a marine!"

Musical Husband

Do you play any musical instrument?
Only at home.
What do you play there?
Second fiddle.

Foolishment

Why did you shoot your husband with a bow and arrow?

I didn't want to wake the children.

That and More

"He has his back to the wall and his ear to the ground, his shoulder to the wheel and his nose to the grindstone, his head level and both feet on the ground."

"Contortionist?"

"No—a guy trying to do business with the OPA."

That Maid

She planted herself firmly in front of him and gritted her teeth. "Henry," she snapped, "you thought I didn't see you, but I did. You kissed the maid."

He paled. "But darling, you asked me to try and persuade her to stay another week."

"Henry," she melted, "tell me quick—did she promise to stay?"

He Knows

He: "Is that lipstick hard to get off?"
She: "Find out for yourself, dummy."

Drove On

"You tell me that this is the person who knocked you down with his motor car. Could you swear to the man?"

"I did, but he only swore back at me and drove on."

Standco NO-SMOKE

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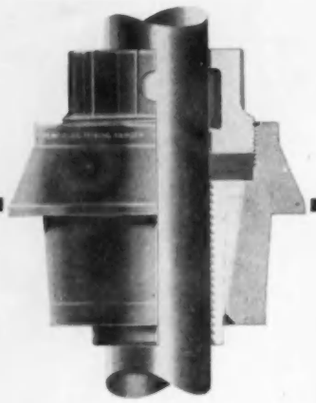

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Men in the Industry's News

JOHN M. MOUSER, Houston district landman for the Midstates Oil Corporation, is moving to Wichita Falls, where the company is establishing an operating office.

CHARLES J. HOFFMAN, head of the land department of Southland Royalty Company, Fort Worth, has resigned to operate independently and will maintain headquarters at Fort Worth.

H. W. IMHOLZ, Abilene, Texas, consulting geologist and operator, has joined Hunt Oil Company, Dallas, to take charge of a West Texas operating office to be established in the Wilkinson building, Midland. The company will specialize in wildcat explorations.

LOUIS BRADIE has been elected president of American Sand-Banum Company, New York, filling the vacancy left by the recent death of George A. Kubler. Bradie has been secretary and treasurer of the corporation since it was founded in 1926. F. Fullgrabe, former assistant secretary, has been promoted to secretary. The company manufactures corrosion eliminants.

THOMAS A. MORGAN, president and director of The Sperry Corporation, was recently elected a director of the Shell Union Oil Corporation, New York City. Morgan is also a director and chairman of the executive committee of Pan American Airways Corporation and chairman of the board of directors of Sperry Gyroscope Company. He is a member of the board of governors of The Aeronautical Chamber of Commerce of the United States, a director of the National Foreign Trade Council, and The American Arbitration Association.

GEORGE LIGGETT CRAIG, 78, of Sewickley, Pa., who at 20 entered the oil business in Pennsylvania, died February 19. In 1891 he supervised construction of the Crescent pipe line to the Eastern seaboard; in 1902 was general manager in the reorganization of J. M. Guffey Petroleum Company which later became Gulf Oil Corporation. With his brothers he helped organize Craig Oil Company, Toledo, Ohio; Freedom Oil Works Company Freedom, Pa.; Chartiers Oil Company, Pittsburgh, of which he was president when he died.

EDWARD J. HERZOG, recently returned from Venezuela where he was regional supervisor for the Caribbean Area, has been appointed manager of the Oil and Mining Division of Westinghouse Electric International Company, New York. He will direct all sales to the oil and mining industries outside continental United States and Canada. Herzog has served the company in various capacities since 1928, immediately after receiving his Electrical Engineering degree from the University of Illinois. Transferring to Westinghouse International Company in 1929, he was successively in the Order Department, Power Division, Merchandising, Industrial, and Sales Departments. In 1940 he went to Trinidad as regional supervisor of the Caribbean Area, moving his headquarters to Caracas, Venezuela, in 1942. He returned to New York in December, 1943.

DR. FREDERICK G. CLAPP, 64, internationally known geologist and consultant to a number of foreign governments, died in Chichasha, Oklahoma, February 18, after being stricken with spinal meningitis. He had recently returned from Turkey where he was petroleum consultant to the Turkish government. He had served as consultant and adviser to the governments of China, New Zealand, Australia, Iran and other countries and from 1911 to 1915 was petroleum and natural gas expert for the Canadian Department of Mines.

HARRY H. STOOPS has been named district representative for Lamtex Equipment Corporation with headquarters at 228 West 12th Street, Hutchinson, Kansas.

ROBERT R. McLACHLEN, former assistant director of PAW's Materials Division, is now Southern Division sales manager for Rheem Manufacturing Company, and is making his headquarters in Houston.

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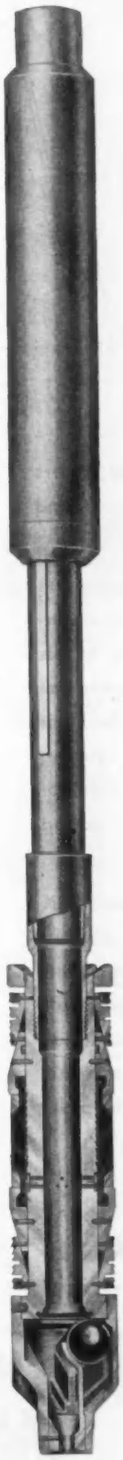
Awarded to Los Angeles Plant - 1943

BAKER OIL TOOLS INC. BAKER SERVING THE WORLD



Product No. 400
Baker Model "K" Cement Retainer (with Circulation Joint)

Provides a safe, sure means of placing cement through tubing or drill pipe at the place where it will be most effective, at any pre-determined point behind casing or liner; or around the shoe. It is adaptable to any pressure within the safety factor of the casing.

IMPORTANT FEATURES:

POSITIVE PACK-OFF

There are two important construction features which assure positive sealing against casing and eliminate any possibility of fluid by-pass. Tool is hydraulically tripped and when set, the oil resistant packing forms a positive seal against the casing. One feature is the provision of a lead ring on either end of the packing member, which, when the latter is expanded, hermetically seals the ends of the packing, preventing any possibility of fluid by-pass. The second important feature is the use of flow stop discs, small metal discs located in the body of the Retainer underneath the packing. These discs act as valved fluid ports and prevent any flow of the packing into the Retainer Body when the packing is compressed.

RETAINER WILL STAY WHERE SET

Two sets of annular, segmented wickered slips prevent movement of the tool, once it is set, either up or down the hole.

EFFICIENT BACK-PRESSURE VALVE

The Ball Back-Pressure Valve, which becomes operative immediately after retainer is set, prevents return or equalizing of the slurry.

FLUID CAN BE BLED OFF

At any time during circulating or cementing operations, fluid can be by-passed through Circulation Joint, which is run just above the Cement Retainer.

HIGH PRESSURE POSSIBLE

The Baker Cement Retainer will safely withstand any pressures that can be imposed within the safety factor of the casing in which it is set.

Service Note
Competent Baker men will advise, make suggestions, and otherwise assist in securing best possible results.

Yes, it's a fact. Patterson-Ballagh Pipe Wipers very definitely reduce the danger of slippery and icy conditions on drilling floors.

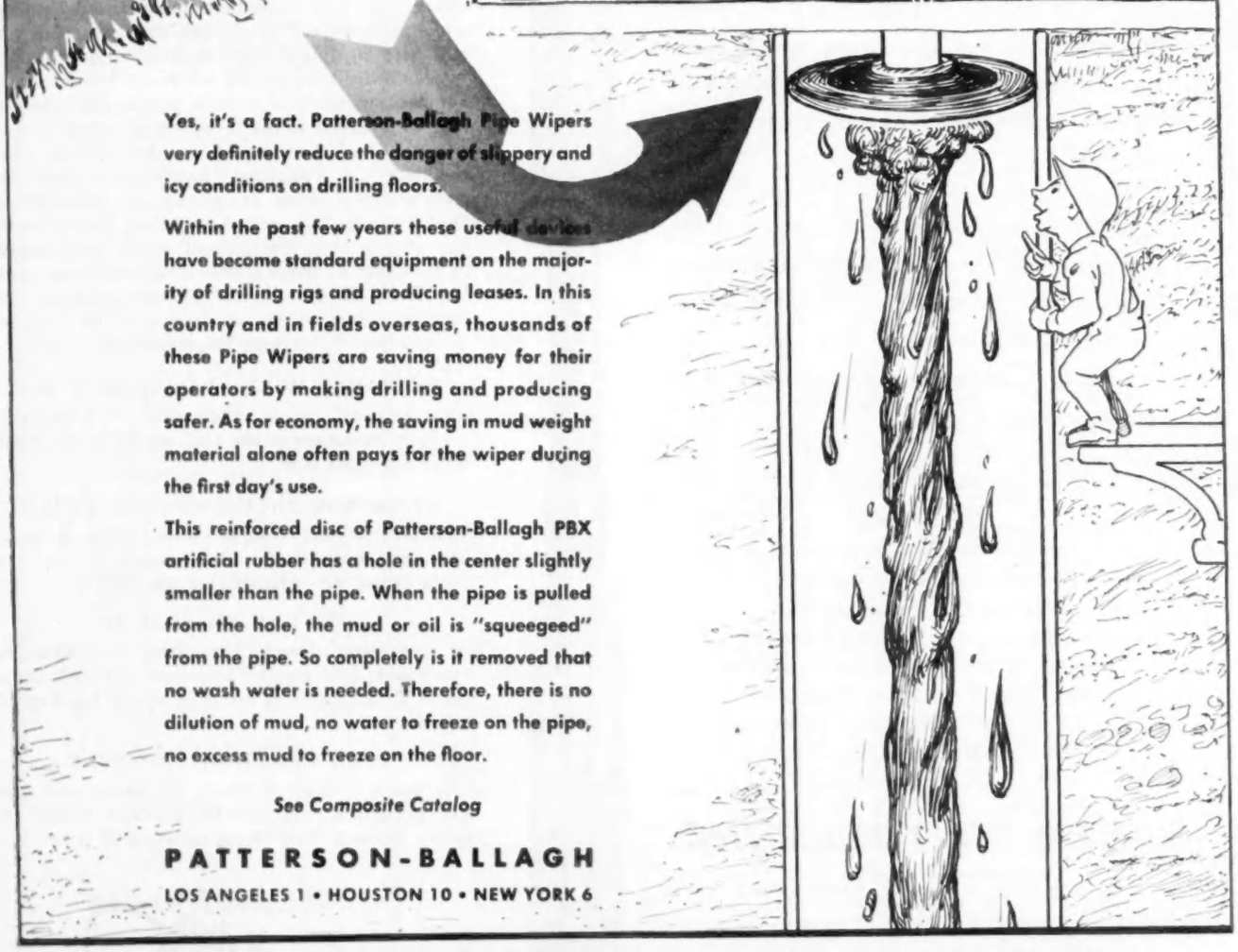
Within the past few years these useful devices have become standard equipment on the majority of drilling rigs and producing leases. In this country and in fields overseas, thousands of these Pipe Wipers are saving money for their operators by making drilling and producing safer. As for economy, the saving in mud weight material alone often pays for the wiper during the first day's use.

This reinforced disc of Patterson-Ballagh PBX artificial rubber has a hole in the center slightly smaller than the pipe. When the pipe is pulled from the hole, the mud or oil is "squeegeed" from the pipe. So completely is it removed that no wash water is needed. Therefore, there is no dilution of mud, no water to freeze on the pipe, no excess mud to freeze on the floor.

See Composite Catalog

PATTERSON-BALLAGH

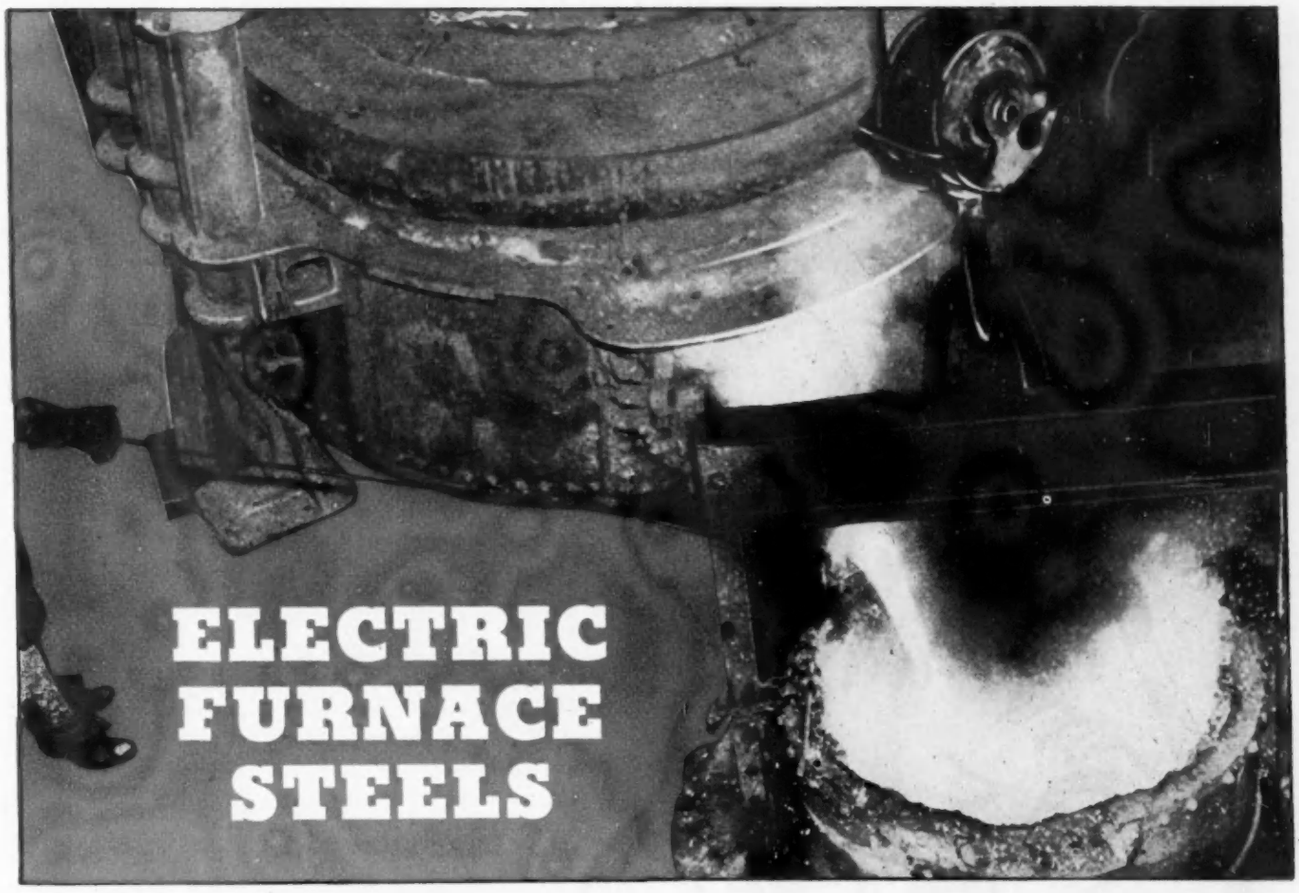
LOS ANGELES 1 • HOUSTON 10 • NEW YORK 6



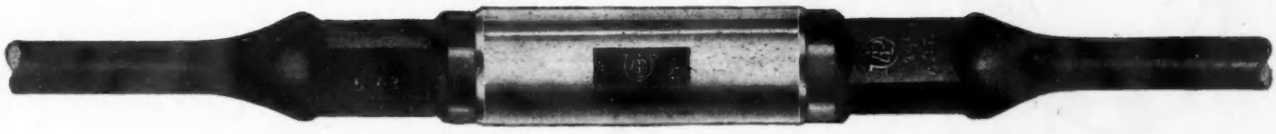
PATTERSON-BALLAGH

PIPE WIPERS

THE OIL WEEKLY, published every Monday. Entered as second class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879.



. . . forged into weapons of war at Texasteel Mfg. Co.



For our Soldiers and Marines on the fighting fronts we make vast numbers of deadly mortar shells.

For oil men on the equally important producing front we manufacture all grades of API Sucker Rods . . . forged from the finest Electric Furnace Steels.

Texasteel Rods made from Electric Furnace Steels provide additional strength, toughness, hardness and resistance to fatigue and corrosion — properties that assure low cost oil field service. Now that rods must be conserved and made to give longer service, the superior properties of Electric Steel are an advantage not to be measured in dollars and cents alone, but also in the amount of steel saved for more war production.

Texasteel Rods . . . of Electric Steel . . . cost no more than other rods. Next time you order Sucker Rods, Polished Rods or Pull Rods, take advantage of the steel of tomorrow that is available today in Texasteel Rods. Write to our nearest office for quotations.

TEXASTEEL MANUFACTURING CO.

FORT WORTH, TEXAS

Houston, 217 West Bldg., Phone Charter 4-3301 • Kilgore, P. O. Box 916, Phone 724 • Wichita Falls, P. O. Box 673, Phone 2-0803

The Steel of Tomorrow Is Available Today

BOY! HAVE I BEEN PLACES!

Tiger Brand has been scarce on the home front . . . for military reasons only

BECAUSE we are the world's largest manufacturers of wire rope, it was logical for Uncle Sam to turn to us early for help in supplying the huge tonnages of wire rope needed for the war effort. To date, American Tiger Brand Wire Rope has been used in breath-taking quantities on every front.

As new and unusual service tasks had to be faced, our engineers produced the right wire rope to meet them. Our plants were kept running around the clock. Production facilities were expanded again and again to keep pace with wartime needs.

Now a growing amount of Tiger Brand is becoming available for use here at home. This wire rope incorporates all the improvements that war-stimulated advancement in rope-making technique provides. So, when you need wire lines—and want the best—get in touch with your Tiger Brand distributor.

Excellay Preformed

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York

COLUMBIA STEEL COMPANY
San Francisco

United States Steel Export Company, New York

UNITED STATES STEEL

OVER THE HUMP
with war-swollen freight

You are looking at the world's largest classification yard.

Here, 8,000 cars a day, loaded with freight roll down the hump, are sorted and sent on their way to cities and hamlets across the breadth of the land.

These loaded cars rolling downgrade to the classification tracks would gain tremendous momentum were it not for the electrical retarders placed at intervals along the track. These retarders slow up the cars by gripping the wheel flanges with steel fingers.

Here is another job where Foote Bros. gears are working 24 hours a day helping get America's most important job—winning the war—done.

But the sturdy speed reducers—the compact actuators—the extreme precision gears that Foote Bros. are today producing for the Army, the Navy and for industry hold promise to American manufacturers of new efficiencies in the transmission of power made possible by new engineering developments—new manufacturing "know hows" acquired in the stern laboratory of war.

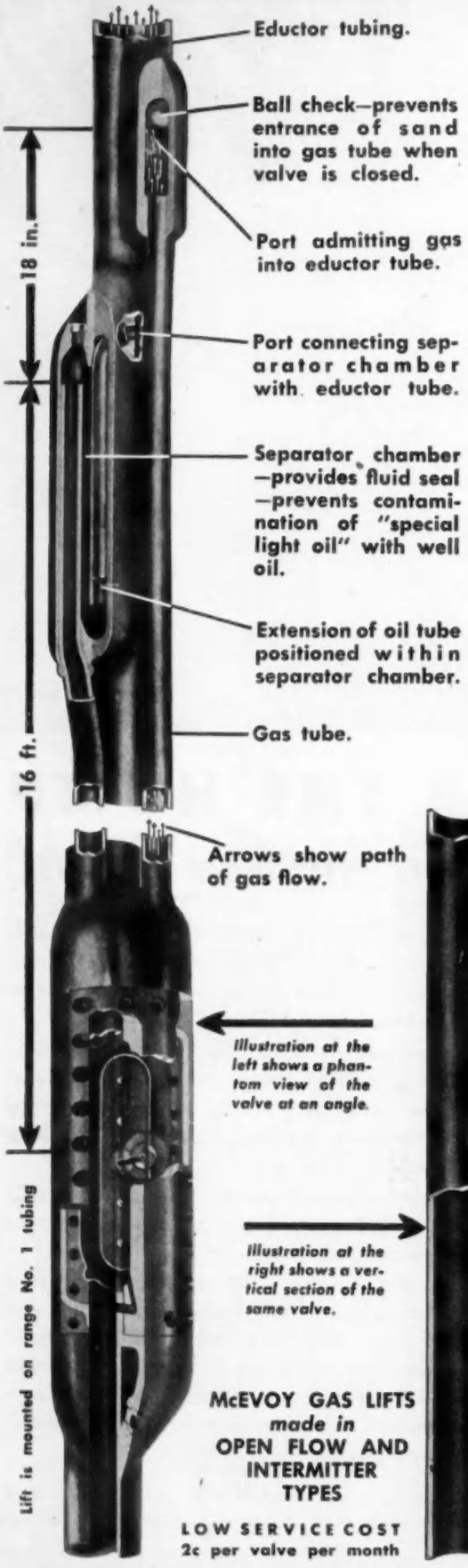
FOOTE BROS. GEAR AND MACHINE CORPORATION
5225 South Western Boulevard • Chicago 9, Illinois

INDUSTRIAL AND PRECISION GEARS
• SPEED REDUCERS • MOTORIZED
REDUCERS • AIRCRAFT DEVICES

FOOTE BROS.

Better Power Transmission Through Better Gears

McEVOY *Self-Operating* GAS LIFT


Eductor tubing.
Ball check—prevents entrance of sand into gas tube when valve is closed.
Port admitting gas into eductor tube.
Port connecting separator chamber with eductor tube.
Separator chamber —provides fluid seal —prevents contamination of "special light oil" with well oil.
Extension of oil tube positioned within separator chamber.
Gas tube.
18 in.
16 ft.
Arrows show path of gas flow.
Illustration at the left shows a phantom view of the valve at an angle.
Illustration at the right shows a vertical section of the same valve.
Lift is mounted on range No. 1 tubing
"Special light oil" tube.
Gas lift body.
Port conducting "special light oil" to back side of diaphragm.
Orifice admitting gas from casing annulus.
Orifice pin (valve).
Diaphragm assembly.
Port permitting entrance of well fluid to front side of diaphragm.
Sump.

McEVOY *Self Operating* GAS LIFT

Counter-Hydrostatic Principle . . . valves open and close in synchronization with the well flowing characteristics

Results: More fluid recovered • Lower gas-oil ratio • Lower Production costs
Proven low maintenance costs

The lift utilizes the principle that a column composed of a mixture of gas and fluid is "lighter" than an equal column composed only of fluid. These two columns are located in the tubing and in the "oil tube," respectively. The first is the column of well oil fluid in the eductor tubing—the second is the "oil tube" column which forms part of the gas lift and is filled with special fluid before running tubing. The hydrostatic pressures exerted by these columns act upon opposite faces of the diaphragm which, in turn, automatically controls the gas inlet valve.

As each valve is uncovered by the downward movement of the fluid in the casing annulus, the valve immediately above is closed by the aerated column created by the gas admitted into the tubing through the lower valve. Gas is always admitted through the lowest uncovered valve.

With the McEvoy Self-Operating Gas Lift you don't have to close the valve when the fluid above it has been lifted. It closes automatically when the input activating gas begins to operate through the next valve below.

McEVOY GAS LIFTS *made in* **OPEN FLOW AND INTERMITTER TYPES**

LOW SERVICE COST
2c per valve per month

The Army-Navy "E" proudly flies over the McEvoy Plant . . . having been awarded to the people of McEvoy Company for high achievement in the production of war products.

Write for new '43-'44 Catalog

ARMY E NAVY

SERVING THE OIL INDUSTRY SINCE 1906

McEVOY COMPANY

TEXAS AT MUIRY HOUSTON, TEXAS

Why LANE-WELLS maintains Test Wells!

IN PRINCIPAL OIL FIELDS

As a Service Organization doing many hundreds of jobs each month, Lane-Wells is called upon to check oil well depths determined in a variety of ways.

Of the many methods used by oil company personnel, the careful measurement of drill pipe in strain is considered to be the most accurate. Comparable measurements are: tubing measured in strain; casing measured in strain; and calibrated steel line measurements.

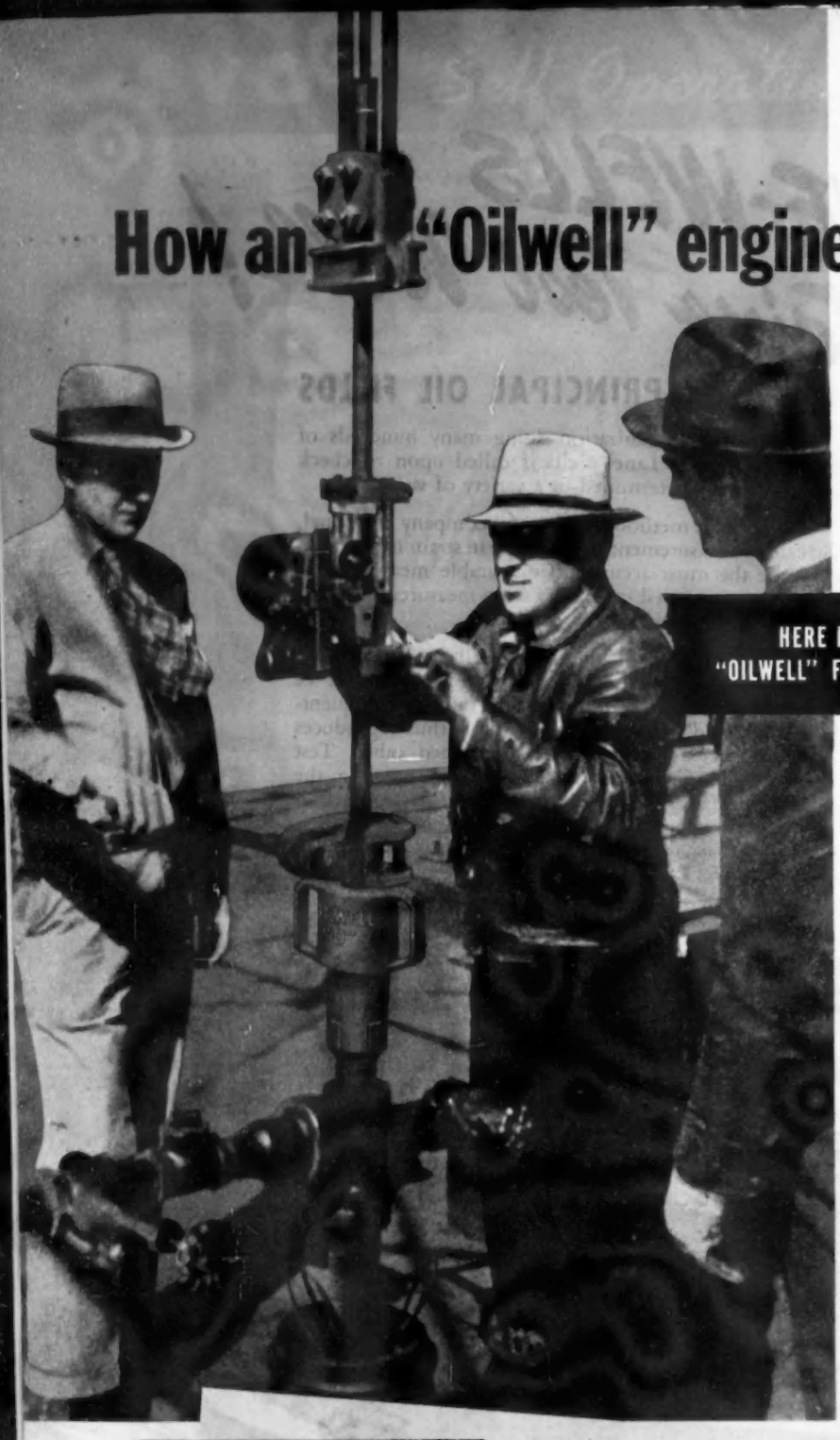
The permanence of the Lane-Wells calibrated line measurement system is well established by the use of actual measured test wells in which all cables are frequently checked and calibrated. A new cable thus reproduces measurements as accurately as a seasoned cable. Test wells in all Lane-Wells divisions make possible the regular calibration of wire lines to maintain high standards of accuracy in all measuring operations.

FIGHTING Tomorrow's Tools-Today!

LANE WELLS COMPANY

Factory, General and Export Offices:
5610 South Soto Street, Los Angeles
Houston Oklahoma City
24-Hour Service • 30 Branches

How an "Oilwell" engineer found the answer to a pumping problem



HERE IS A TYPICAL EXAMPLE OF HOW "OILWELL" FIELD ENGINEERING SERVICE WORKS

FREQUENT rod breaks in a number of 5400-ft. wells were causing an Oklahoma producer no end of trouble, interrupting production and necessitating costly fishing jobs. There was no indication that the ¾-inch sucker rods were overloaded; but the fluid level was known to be low, and there was evidence of some bottom-hole difficulty.

At the request of the manager of a nearby "Oilwell" store, an "Oilwell" subsurface equipment engineer called on the producer and made a careful analysis of the pumping characteristics of the wells. Weighing the wells with a dynamometer, which accurately records pumping conditions not perceptible to eye or touch, indicated that the pumps were pounding fluid, setting up a vibration which caused the premature rod failures.

Discussing his analysis of the problem with the producer, the "Oilwell" engineer showed how the trouble could be remedied by changes in operation. The producer followed the engineer's recommendations with the result that sucker rod failures have been avoided with no decrease in production.

Field engineering service is just one of the *plus* values you get under "Oilwell's" 10-Point Supply Service. Study the others. It will pay you to deal with "Oilwell"—where your business is appreciated.

WHAT YOU GET FROM "OILWELL" 10-POINT SUPPLY SERVICE

1. Dependable source of supply
2. World-wide distribution
3. Adequate warehousing to protect material and to speed deliveries
4. Convenient store locations
5. Field engineering assistance
6. Product design and metallurgy keyed to your needs
7. Extensive manufacturing and testing facilities
8. Highest grade supplies for oil and gas field needs
9. Prompt and understanding credit service
10. 82 years of practical experience.

teel needs nore scrap NOW— Send it in!

Army-Navy "E"—Imperial Works. Maritime "M" and Victory Fleet Flag—Wilson-Snyder Manufacturing Division.

OIL WELL SUPPLY COMPANY

EXECUTIVE OFFICE—DALLAS, TEXAS
DIVISION OFFICES—COLUMBUS, OHIO
DALLAS, TEXAS — LOS ANGELES, CALIF.

Branch Stores Serving All Oil Fields
United States Steel Corporation Subsidiary

EXPORT DIVISION OFFICE
30 ROCKEFELLER PLAZA
NEW YORK CITY

There is a size and type **LOUIS ALLIS** *electric motor for every industrial requirement.*

THE LOUIS ALLIS CO., MILWAUKEE 7, WIS.

The War is not Won—Yet!

A few robins don't make the summer — and neither do a few victories — as important as they are — mean that the war is WON!

From December 7, 1941 we have come a long way — a modern miracle in war production and military achievement has been performed.

Important victories are being chalked up for our side — we are taking the offensive and the initiative, but we have a long, long way to go before the war is definitely and finally WON!

To let down in our efforts now — even the slightest — will be a tragic mistake that will be paid for by the warm life-blood of our sons.

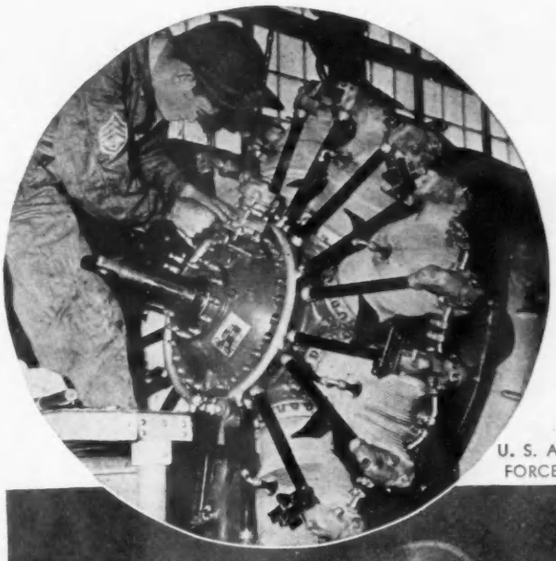
We here at Louis Allis are redoubling our every effort in every way to help win this war — to get it over as quickly as possible.

★

If you are planning a post war product that will require a special electric motor in its construction, our engineering development department will welcome the opportunity of working with you — just as soon as Uncle Sam does not require our full capacity.

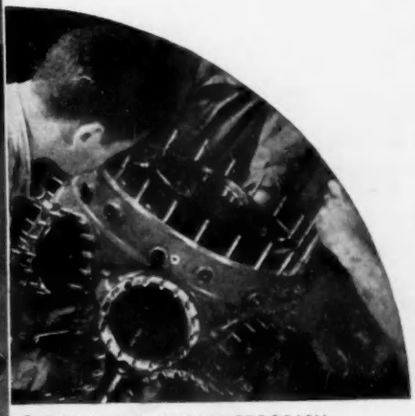
THE LOUIS ALLIS CO., MILWAUKEE 7, WIS.

Thousands of Flying Horsepower Held in Control by **LANDIS** *Threaded Studs*



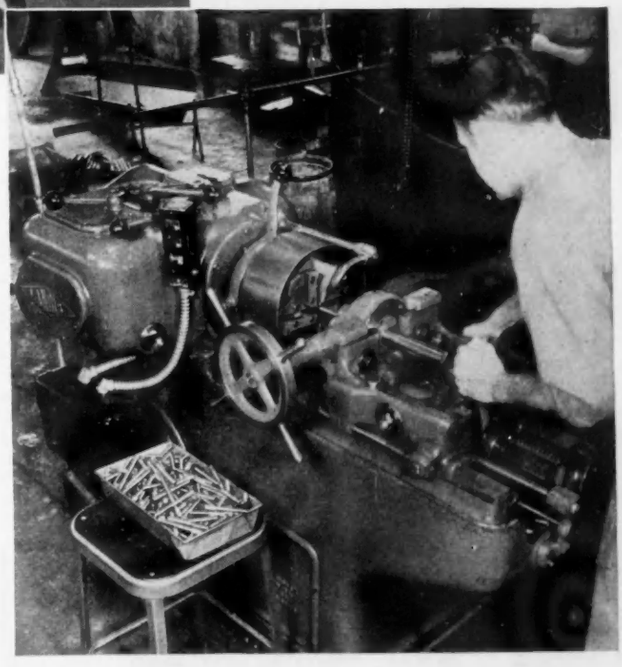
U. S. ARMY AIR FORCES PHOTO

OFFICIAL U. S. NAVY PHOTOGRAPH

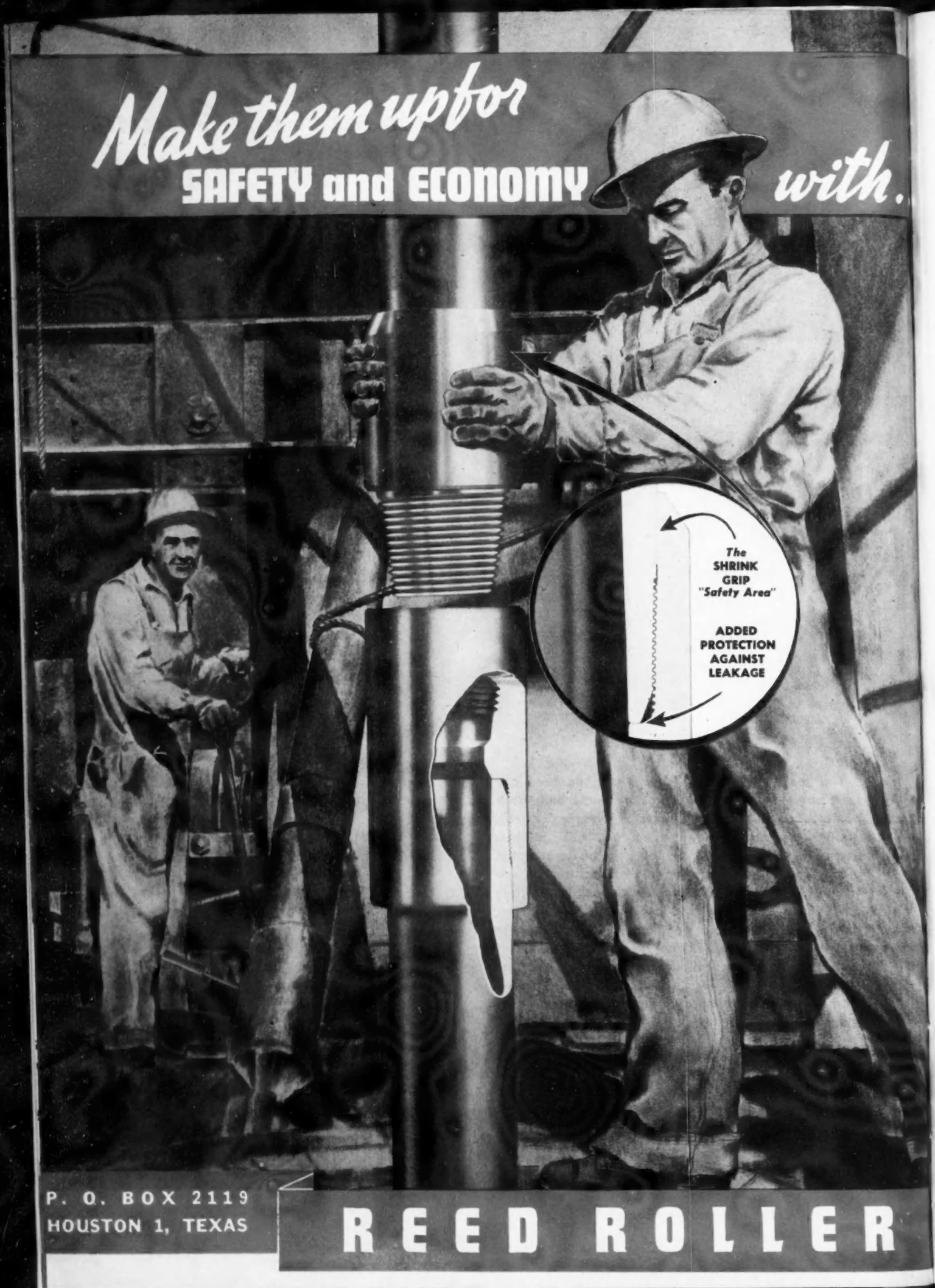


OFFICIAL U. S. NAVY PHOTOGRAPH

The motor is the all important heart of our fast, powerful warplanes. In carrying tremendous bomb loads to distant targets at amazing speeds, in dive bombing, escaping enemy ack ack, battling enemy fighters and in bringing home a crippled plane, the engines are under terrific strain and vibration. But American engines have proved they can take it and keep going, mission after mission, thanks to American engineering. One of the reasons for the excellent performance of our warplane engines is the minute accuracy of the specially designed — — LANDIS THREADED — — studs employed in the cylinder heads, blocks and crankshaft cases.



LANDIS MACHINE COMPANY, WAYNESBORO, PENNA, U.S.A.


Make them up for
SAFETY and ECONOMY with.
The
SHRINK
GRIP
"Safety Area"
ADDED
PROTECTION
AGAINST
LEAKAGE
P. O. BOX 2119
HOUSTON 1, TEXAS
REED ROLLER

EVERY International Power Unit on the job today goes into 1944 as a *year-older* engine.

Many of these year-older Internationals are veterans—and by veterans we mean engines that have seen five years or more of service, engines that normally would have been replaced by new ones.

In this time of emergency International Service is more valuable than ever. International Power Unit design and manufacturing policy make it possible to replace worn parts with *Genuine International Parts* that fit just like the originals because they are made from the same molds. International Replacement Parts help make your *year-older* engine perform like new.

Guard and care for your Internationals this year as never before. International performance, stamina, and dependability put them out in front in days of peace; International *Service* keeps them out in front in these days of war. Count on your friend, the International Industrial Power dealer, to help keep your equipment *fit and fighting!*

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

BUY BONDS···BUY MORE BONDS

INTERNATIONAL Industrial Power

MALONEY BOLTED TANKS GIVE YOU MAXIMUM of CAPACITY per INVESTED

The DURABILITY, DEPENDABILITY and UNIFORMITY of the material in MALONEY TANKS gives you the best tankage available today.

All seams and zones that would normally be structurally weak are reinforced in MALONEY TANKS. This is but one of the reasons why these tanks stay on the lease longer, hold more oil, and give you more barrels of capacity for every dollar invested in MALONEY TANKS.

Whatever your lease requirements, whatever your crude oil characteristics, MALONEY TANKS will adequately answer your needs. If you haven't tried MALONEY TANKS, call or write us.

Maloney Tank Mfg. Company, 38 No. Peoria, Tulsa, Oklahoma

Welded Tanks

Bolted Tanks

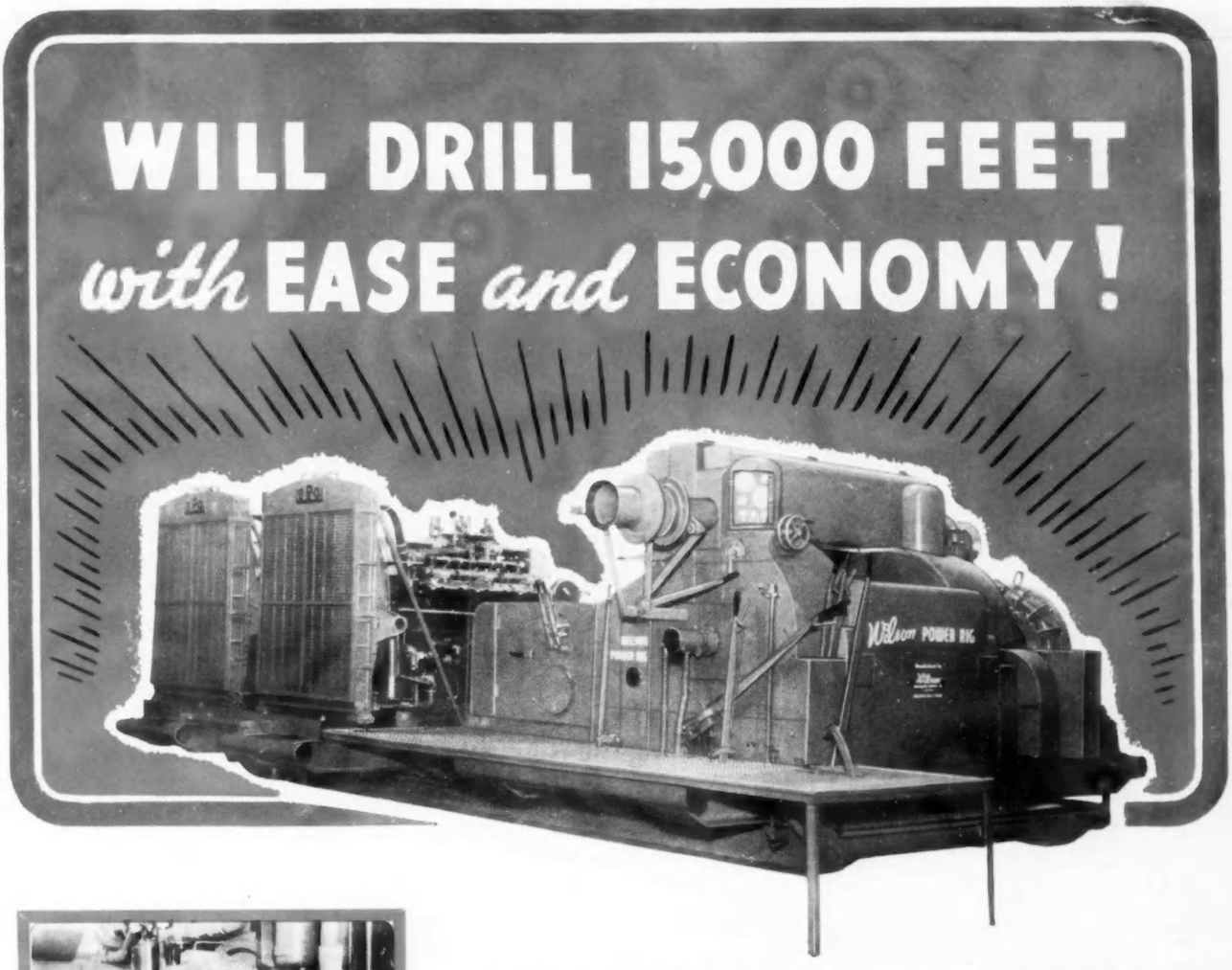
MALONEY

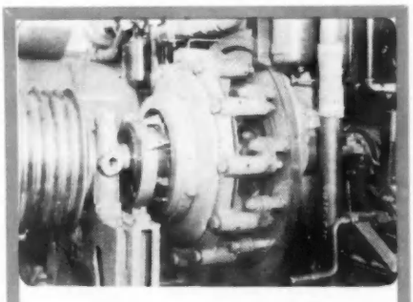
Oil and Gas Separators

Pressure Vessels

Keep America American • Freedom of Free Enterprise

WILL DRILL 15,000 FEET *with* EASE *and* ECONOMY!





8 NEW FEATURES

In addition to the many features which have made WILSON RIGS world famous, eight new improvements are being added to the new Super Titan Model, which are:

1. Vaca-Manual Drum Clutch Controls
2. Vacumatic Transmission Speed Changer
3. New Shift Lock on Chain Transmission
4. Improved Water Box
5. Improved Hydromatic Brake Coupling
6. New Method of increasing life of Bearings and Shafts
7. New Link Type Engine Clutch Flexible Coupling
8. New Disc Type Rotary Clutch with "Lock-Tite" Splined Steel Hub. (Illustrated above.)

WILSON SUPER TITAN

The Most Powerful Power Rig!

The most powerful power rig, capable of drilling 15,000 feet with ease and economy.

This, the Super Titan Model, is the newest and largest capacity rig of the universally known and used Wilson line.

The drum shaft is made from 9-inch alloy steel; the transmission output shaft has been increased to 7 inches; chains on the drum drives are 2½ inches double; the drum barrel is 30 inches in diameter. Other parts have been increased in size and strength so as to handle three 350 H.P. engines, or 1050 H.P. rated capacity.

While designed principally for a three-engine drive, using engines of approximately 350 H.P., additional engines can be used if needed.

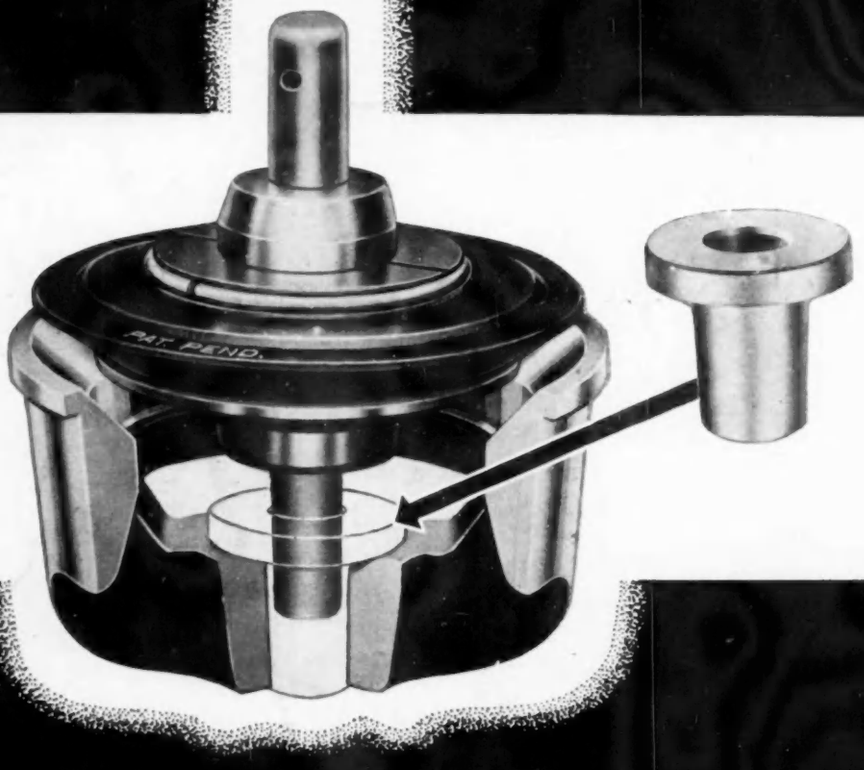
Wilson

WILSON MANUFACTURING COMPANY, INC.

WICHITA FALLS, TEXAS, U. S. A.

EXPORT REPRESENTATIVE: GUY E. DANIELS, 30 ROCKEFELLER PLAZA, NEW YORK CITY
PACIFIC COAST DISTRIBUTOR: H. & B. SALES CO., LTD., LONG BEACH, CALIFORNIA

MISSION VALVES *save materials*



important in total war . . . money-saving any time

THE MISSION principle of "Change the bushing and save the seat" saves vital war metal.

You save an 18-pound seat by changing a one-pound wear-taking bushing. Or in terms of money, you save a seat costing $15 (Series 3. Other sizes in proportion) by merely replacing the worn bushing with a new one costing $1.75.

In many instances the life of Mission Valves has been extended 200% to 500% longer by the operator giving attention to replacing the wear-taking bushing at the proper times, thus saving critical war material.

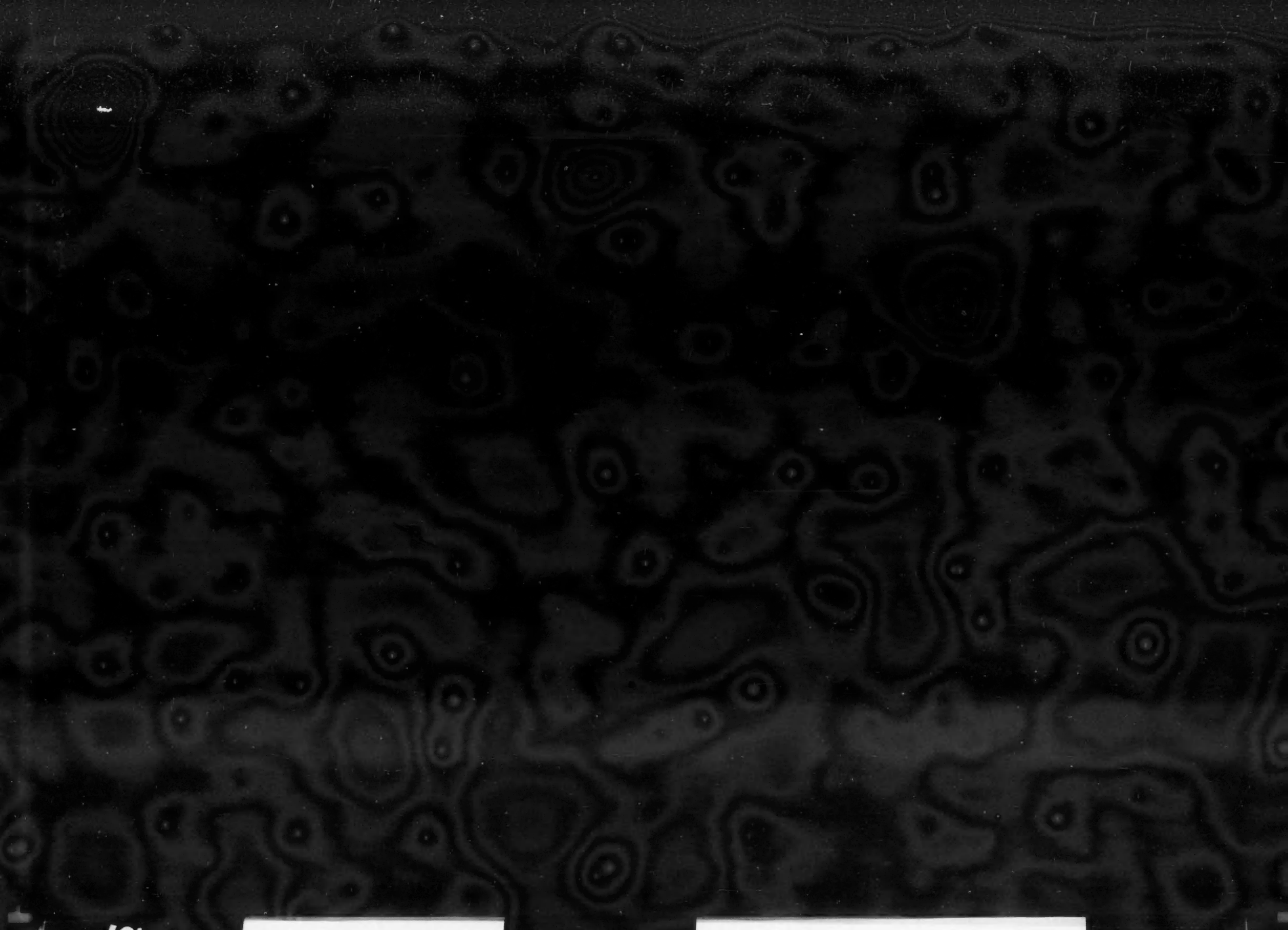
Mission Compound-308 Valve Inserts save vital war rubber.

They last three to five times longer than regular inserts in ordinary mud, and up to ten times longer than regular oil-resisting inserts in hot mud, treated mud, or oil and gas.

GUARANTEE { If a competitive test in your pumps does not prove that Mission Slush Pump Valves (with Compound-308 inserts) are more economical than the valves you are now using, the entire purchase price of these valves will be promptly refunded. }

CHANGE THE BUSHING AND SAVE THE SEAT

MISSION MANUFACTURING CO.

HUMBLE ROAD, HOUSTON, TEXAS

EXPORT OFFICE: 30 ROCKEFELLER PLAZA, NEW YORK